MORAN MUNICIPAL GENERATING STATION DECONSTRUCTION AND DEMOLITION STUDY

Study compiled by City of Burlington – Community Economic Development Office (CEDO) 3/24/17

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Executive Summary

The Moran Plant: Overview and Redevelopment Efforts

The Burlington Waterfront has changed dramatically since it was filled to create an area for major industry including lumber processing, manufacturing and electric generation at the Moran Municipal Generating Station, more commonly known as the Moran Plant. Over the past thirty years, the area has opened to the public with the acquisition of more than 60 acres by the City, and the creation of a bike path, parks, ECHO, Leahy Center for Lake Champlain and recently a new skate park, a new home for the Lake Champlain Sailing Center (CSC) slated to open in the summer of 2017, and a new private marina in the works.

The Moran Plant generated electricity for the city with a coal-fired system and then wood burning from 1957 until it was rendered obsolete in 1982. In 1986, the Moran Plant was transferred from Burlington Electric to the City and in the intervening years, many proposals have been crafted and reviewed for adaptive re-use for public benefit. Proposals hit various roadblocks including those outlined below:

- Concepts have been too costly or unrealistic in terms of site conditions;
- High cost of environmental remediation;
- Many uses are not allowed under the restrictions of the Public Trust Doctrine;
- Numerous design and engineering constraints;
- Need for additional parking that is difficult to accommodate; and
- Operations and maintenance costs are high.

In 2014, the voters approved several projects, one of which included a proposal to redevelop the Moran Plant by New Moran, Inc., (NMI) a Vermont 501(c) 3 organization, created to facilitate the redevelopment of the Moran Plant as a publicly accessible, financially sustainable, waterfront, and cultural landmark. After over two years of working on the project, the City of Burlington and NMI agreed, by mutual consent, on July 20, 2016 to dissolve an exclusive August 19, 2014 Memorandum Of Understanding (MOU). Working with City Council, the City issued a new Request for Qualifications (RFQ) and Detailed Letter of Approach (LOA) in September, 2016 for the vision supported by the voters in 2014. One proposal from NMI was received by the submittal deadline in December 2016. The City is currently reviewing this proposal to assess the feasibility. More detailed information on the history and past redevelopment efforts can be found in Section 1 of this report.

The Community and Economic Development Office (CEDO) was also requested to provide information on demolition of the building. This report provides a summary of key areas of federal, state and local requirements, and provides four demolition scenarios and associated costs. There is also an overview of redevelopment requirements and opportunities if the Moran Plant was demolished.

The Moran Plant: Demolition

Demolishing a structure like the Moran Plant is not a simple task. Because of its past industrial uses for electrical generation, there are environmental concerns in the structure that must be removed safely. It is close to Lake Champlain so ensuring water quality is critical. The building is of historic significance, listed on the National Register of Historic Places, and due to the funding streams, review is required. Federal and state funds have been utilized for building stabilization and environmental remediation over the years and there are requirements that must be considered. The report outlines each of these issues in Section 2 as follows:

- Financial Obligations: Over the years, federal and state funds have been used for stabilization and remediation and this section outlines any requirements and next steps for demolition.
- Historic Preservation: The building is listed on the National Register of Historic Places and federal and state regulations must be followed when considering demolition. The City also has requirements for significant historic resources. This sub-section outlines the regulations, and cost associated with ensuring federal, state and local regulations are followed.
- Environmental Considerations: This section provides an overview of the environmental concerns, remediation to date, and additional remediation required for demolition.

In order to estimate the cost of demolition and needed environmental remediation of the site, CEDO hired a consultant to examine the environmental contamination of the site who worked with staff to develop various demolition scenarios with different levels of remediation. Professionals were contracted to provide estimated costs for each scenario. The scenarios chosen for analysis are the following:

- *Scenario 1:* building would be demolished to current grade, (approximately 103 feet above sea level (fasl);
- *Scenario 2:* building would be demolished to a depth of 2-feet below current grade (101 fasl);
- *Scenario 3:* building would be demolished to a depth of 96 fasl (assumed current elevation of lower basement floor); and
- *Scenario 4:* building would be demolished to a depth of 86 fasl, which would include the removal of concrete footers, foundations, and subsurface structure.

Costs for demolition, including historic preservation mitigation, local permitting costs, etc. are outlined in Section 2.5 of the report, with detailed analysis in the Appendix Section 5.10. They range from $3,983,773 to $5,414,966 for Scenario 1 to $8,745,230 and $10,716,661 for Scenario 4 which requires extensive environmental remediation.

Section 3 of the report outlines the redevelopment opportunities for the site if the building is demolished and highlights key timing issues relating to City zoning. The final Section provides a summary check list and potential funding sources for demolition and redevelopment.

1 The Moran Municipal Generating Plant's Place in History & Past Redevelopment Efforts

Starting in the mid-1800's, thousands of yards of stone and fill were placed in Lake Champlain, creating a progressively larger land area for lumber processing, wharfing, and manufacturing for the City. This fill transformed Burlington's Waterfront from a long crescent sand shoreline into a commercial waterfront. Over time, the waterfront transitioned from a lumber port into a rail yard, and eventually a bulk petroleum facility, with the vast majority of these prime waterfront lands rendered inaccessible to the public.

Figure 1: Burlington Waterfront in the 1800's

By the 1950's, gasoline, JP-4 jet fuel, and heating oil were being stored on the waterfront, with barges, trains and trucks frequenting the facilities. The Moran Municipal Generating Station (Moran Plant) is part of the history of the industrial waterfront, coming on line in 1954 as a coal-fired electric generation facility. It facilitated the debut of electric heat to the City in 1957 and in the late 1970s conducted the successful experimental conversion of the coal-fired system to a wood-burning one which, while gaining world-wide attention and acclaim, ironically rendered the plant largely obsolete by 1982. It produced electricity until decommissioning in 1986. Since that date, the majority of the building has remained vacant.

Figure 2: Moran Plant and Fuel Storage

As times and the nature of industry have changed, the City's Waterfront has undergone a transformation. Since the 1980's, over 60 acres of Waterfront land has been acquired by the City, all bulk petroleum tanks removed, buildings and foundations demolished, and a 40-acre "Urban Reserve" created for "future generations" to decide on its use. The result has been incredible. Once an area not utilized by the public, the Waterfront is now enjoyed by Burlingtonians and visitors alike with strong citizen support for the transformation.

The Community Boathouse, Waterfront Park and Promenade, new Coast Guard building, and ECHO, Leahy Center for Lake Champlain (ECHO) have been constructed, a harbor breakwater repaired, a public fishing pier and historic lighthouse replicas installed – all achieved with City's leadership over many years. Private sector development west of Lake Street has occurred including market rate and affordable housing along with mixed-use developments that are either built, under construction, or in the pre-development stage.

In recent years, a new skate park and bike path upgrades have been completed and Lake Street extended. A new home for the Community Sailing Center (CSC) is slated for completion in the summer of 2017 and a new private marina is planned to begin construction in 2017.

Figure 3: Waterfront Access North redevelopment plan including current skate park

In the context of recent history, the Moran Plant can be viewed as the last remnant of an industrial waterfront that has been forever transformed. During these 30 years of change, significant effort has gone into redeveloping the building and surrounding site without much success.

Given the difficulty of redevelopment, Mayor Weinberger and City Council wanted to fully understand the options for the City, including demolition, and tasked the Community and Economic Development Office (CEDO) with conducting a detailed evaluation of the steps and costs for demolition. This report provides an overview of the various steps that would be required to demolish the building and outlines the redevelopment possibilities of the site.

1.1 Past Redevelopment Efforts

1.1.1 Redevelopment Concepts: 1990 -2006

Since the transfer of the Moran Plant from Burlington Electric to the City Council in 1986, many interesting proposals have been crafted and reviewed for adaptive re-use for public benefit. Unfortunately, they hit various roadblocks. A Renaissance Center for Science and the Arts was proposed, but lacked support and fundraising capacity. Burlington Parks and Recreation and the YMCA considered a recreation center on the Waterfront North of the Moran plant, but concluded that the construction and operations cost were beyond the means of the City. The concept of a baseball stadium was advanced, but it became clear that the size of the site would not meet the stadium's need. There was a brewery and concert hall proposal that were not allowable uses under the Public Trust Doctrine (See Section 3.1 Public Trust Restrictions).

A Request for Letters of Interest in 1993 yielded several proposals, all with inadequate funding or programming plans. The City issued a second request for proposals in 1995, and a proposal by UVM's Fleming Museum was selected. After several years of planning, the Fleming Museum chose not to move forward, turning their energy to further development on UVM's main campus.

In a subsequent effort, after a lively, well-publicized public debate, Burlington voters chose against the creation of a new YMCA and expanded Lake Champlain Sailing Center. Reasons given by those opposed to the YMCA plan varied widely: some wanted to see the building torn down and new park space added, while others sought to change the Public Trust Doctrine and sell the building for development into a hotel and marina, or some other tax-paying entity. There were also those who disliked the proposed arrangement between the City and YMCA; had concerns about traffic and parking; and insufficient public process for the proposal.

The reasons for the failure of other past proposals, include:

- Concepts have been too costly or unrealistic in terms of site conditions;
- High cost of environmental remediation;
- Many uses are not allowed under the restrictions of the Public Trust Doctrine;
- Numerous design and engineering constraints;
- Need for additional parking that is difficult to accommodate; and
- Operations and maintenance costs are high.

1.1.2 Redevelopment Concepts: 2006-2012

In 2008, it was proposed that the Moran plant be converted into a publicly-owned multi-use facility that would appeal to a wide range of users and provide public benefits but also be market driven, complimenting and enhancing the local economy and tax base. This effort included a for profit climbing center, the Community Sailing Center, a space for a major third tenant, café/restaurant, observation deck, public restrooms and office for Parks and Recreation. This effort was discontinued in 2012.

1.1.2.1 Artspace Effort 2012

In fall 2012 into spring of 2013 the City contracted with Artspace to further evaluate the potential of the Moran Plant building and site. Artspace programs fall in three broad categories: Property Development, Asset Management, and Consulting Services. The City asked Artspace to provide a report based on their visit to Burlington and the experiences of other communities that have invested in sustainably affordable facilities for artists. The visit took place November 4-6, 2012 and resulted in three models they believe would qualify as "public use" and might be appropriate for a large, raw space like the Moran:

- **Co-working space:** Co-working spaces are independent business centers that provide a variety of spaces, from individual work stations to meeting rooms, to individuals, small groups, and organizations. Subsequently it was determined this proposed use does not meet the public trust requirements.
- **Maker Space:** Maker spaces, also known as hacker spaces, might be thought of as co-working spaces for artists, scientists, designers and engineers who build things out of metal, wood, electronics, and other media.
- **Temporary uses:** A "tactical urbanism" approach making the building useable, soliciting proposals, and seeing what uses evolve. This path would require an initial investment of several million dollars to address basic structural issues and life/safety considerations. The space itself, however, would remain open and flexible. The temporary uses could range from month-long "happenings" to more extended uses, such as indoor/outdoor markets for art and food, for 12 to 24 months.

1.1.3 Public Investment Action Plan (PIAP) 2013

In 2013, the City felt that progress towards a more vibrant waterfront and downtown had been moving too slowly and proposed investing in public infrastructure that would catalyze additional investments, grow City revenues, increase public access and enjoyment of the waterfront and create housing opportunities for all. To move this forward, the Public Investment Action Plan (PIAP) process was developed.

Over a two year transparent and collaborative process, the Administration identified projects. Lead by CEDO, over fifty concept proposals were received during a two-month Request for Concepts period for infrastructure improvements for the PIAP. Between May 16 and June 4, 2013, the Public Investment Team (PIT) met three times in open, deliberative meetings to review project concepts and advance a total of 29 proposals in 3 categories forward to the next round. The City received 9 final proposals - five from private entities and four from the public sector - many of which were proposals submitted by several of the 29 finalists combining together. Five open houses were held in the City Hall lobby, with comments from those forwarded to the PIT.

Final proposals were discussed and scored by the PIT and then advanced to the Mayor's office, and the Mayor created a project slate to go before City Council Committees. The City Council voted in January, 2014 to put the projects on the 2014 March ballot for a public vote. The projects chosen in the PIAP include the following:

- **Waterfront Park Upgrades**: funds for improved electrical and water infrastructure to enhance Vermont's most visited public park.
- **Lake Champlain Community Sailing Center**: investments to support site improvements for a permanent home and new building for the Community Sailing Center.
- **Burlington Harbor Marina**: support to create a marina on the Northern Waterfront to meet the burgeoning need for boats slips in our harbor.
- **ECHO Sustainability Park**: funds to support creation of new outdoor amenities, educational installations, and lake protection facilities on land surrounding ECHO Lake Aquarium and Science Center, Leahy Center for Lake Champlain.
- **Waterfront Access North**: investments for increased access to the northern waterfront, landscaping, environmental remediation, lake protection, and utility relocation.
- **New Moran**: funds for a mixed-use redevelopment of the building with a focus on green energy innovation, local foods, and a multi-purpose arts and events space.

The outcomes of the March 2014 ballot on the above slate of projects yielded the following results – 69.5% of Burlingtonians gave their approval. Since then the City Administration and Departments have worked hard to advance these approved projects.

1.1.4 PIAP and New Moran Inc.: 2014-2017

In response to PIAP, New Moran, Inc., a Vermont 501(c) 3 organization, was created to facilitate the redevelopment of the Moran Plant as a publicly accessible, financially sustainable, waterfront, and cultural landmark. In March 2014, New Moran Inc. (NMI), led by Charles Tipper, President; Erick Crockenberg, Vice-President; and Tad Cooke, Treasurer, were selected by the City as project developers and operators entering into a Memorandum of Understanding (MOU) on August 19, 2014. This plan called for an allocation of up to $6.3 million in TIF funds intended to provide public infrastructure within the project's original development budget of approximately $25 million.

On July 20, 2016, the City of Burlington and NMI agreed, by mutual consent, to dissolve the August 19, 2014 MOU. Dissolution of this exclusive agreement provided the City the opportunity to explore other partnerships, including with NMI, to implement the vision for the Moran Plant building approved by the voters of Burlington in 2014. The goal was to find an experienced development partner that demonstrated project feasibility and an operating model that would not place undue burden on the taxpayers of the City. The dissolution also allowed the City to analyze the costs, challenges and opportunities posed by possible demolition.

After the dissolution of the MOU, CEDO developed a Request for Qualifications (RFQ) and Detailed Letter of Approach (LOA) that invited responses from qualified, experienced professionals interested in submitting proposals for the redevelopment and operation of the Moran Plant building and associated lands and to execute the core-vision that was advanced by Burlington voters in March 2014. One proposal from NMI was received by the close in December 2016. The City is concurrently reviewing this proposal to assess its feasibility along with demolition.

2 Demolition and Deconstruction of the Moran Plant

Demolishing a structure like the Moran Plant is not a simple task. Because of its past industrial uses for electrical generation, there are environmental concerns in the structure that must be removed safely. It is close to and connected with Lake Champlain so ensuring water quality is critical. Federal and state funds have been utilized for building stabilization and environmental remediation over the years and there are requirements that must be considered. The report outlines critical issues, including past funding requirements, environmental and historic preservation regulations and local zoning requirements that must be addressed if a demolition plan was advanced. In Section 4, a summary checklist is provided and costs are included in the overall demolition estimates in Appendix 5.10.

In order to estimate the cost of demolition and the needed environmental remediation of the site, CEDO hired a consultant to examine the environmental contamination of the site who worked with staff to develop demolition scenarios with various levels of remediation. Professionals were contracted to provide estimated costs for each scenario. Four scenarios are outlined in this section along with cost estimates for each with detailed costs in Appendix Section 5.10. There is a low and high estimate for each scenario as additional environmental testing is need to determine the extent of the contamination.

Once demolished, there are opportunities for redevelopment of the site. The final subsection outlines the state and local requirements for the site. There are many options to consider from additional parkland to uses that meet the Public Trust Doctrine, including government facilities, indoor and outdoor parks, and arts, educational and cultural activities. Eligible uses can be carried out by a municipal, non-profit or private entity. If new buildings are under consideration, timing is key as, under local zoning, there is a time limit if non-conforming structures similar to the one demolished are to be built. Otherwise, current zoning applies, which may limit the size and shape of the building.

2.1 Financial Obligations

The City of Burlington has partnered with several state and federal agencies over the many years of trying to redevelop the Moran Plant. The City has been the recipient of both technical assistance and a variety of grants. This section provides a brief overview of the entities that have provided funding to the City relating to the Moran Plant. The City will need to coordinate with these partners early if demolition is considered.

CEDO has informally reached out to Federal Agencies from which the City has received funding in the past to alert them to the proposed work. These partners have been told of both redevelopment plans and potential demolition options for the Moran building and associated lands.

The City has worked with the U.S. Environmental Protection Agency, the Vermont Department of Environmental Conservation and the Chittenden County Regional Planning Commission's Brownfields program to conduct assessments and remediation work at the Moran Plant and

surrounding site. Initial conversations indicate that assessment and remediation would be needed for the site if redevelopment or demolition were to occur.

The City has worked with U.S. Housing and Urban Development (HUD) for many years and has been a recipient of Community Development Block Grants (CDBG), Section 108 Loans and a Brownfield Economic Development Initiative grant. CEDO utilized funds to support various redevelopment efforts, remediation and other associated items for the Moran Plant. CEDO has been frank with our HUD representatives that if the time came and redevelopment of the Moran plant was not a viable option, the city would consider demolition. It is not clear at this time if HUD would seek to recapture any of these previously expended funds. Further conversations would need to occur if this is the path the city takes. Additionally, there has been significant turnover of HUD staff in the past year, so it may require extra effort to get new staff up to speed on the status of the Moran Plant.

2.2 Historic Preservation Considerations

2.2.1 Moran Plant: Evaluation of Historic Significance

The Burlington Department of Planning and Zoning contracted the Preservation Collaborative in 2005 to perform a historic structures assessment report and recount the history of Public Power Generation on Burlington's Waterfront. The Collaborative provided a detailed analysis of the three related buildings that were or are involved in power generation. Each of the buildings was photographed, described in detail, and significant features of the buildings identified and their condition noted. The history of Public Power Generation was compiled and a recommendation provided for listing the buildings in the National Register of Historic Places individually or as a historic district.

The report, "Assessment of Historic Electricity Generating Facilities on the Burlington Waterfront – January 2006**"** found that all the electricity generating buildings on the waterfront are historically and architecturally significant and would therefore qualify for individual listing, although the application would be stronger if they were listed collectively as a historic district. The Burlington Electric Department (BED) buildings retain their historic significance as a service facility for electricity production, and as such provide a history of the changing nature of electricity production in Vermont. The Moran Plant, while substantially altered, retains the integrity to convey its historical status as a coal-fired electricity generating facility, of which none in the state of Vermont remain in operation. The finding of significance for the Moran Plant stems from the age of the buildings, the importance of its purpose to the community, and the growing rarity of buildings of this type and function. Based on this information, an application was developed for submittal to the Vermont Division for Historic Preservation and the National Register of Historic Places program at the National Parks Service. In recognition of its significance, the Moran Plant was listed as a district in the National Register of Historic Places in 2010.

When reviewing a site for historic significance, both above ground and below ground context should be considered. With evidence of Native American occupation in Vermont extending as far back as 13,000 years ago, it is important to do an archaeological resource assessment of any

site. This will provide an evaluation of the property's potential to yield information important in prehistory or history. Because the Moran Plant was constructed on fill placed in the 1800s as part of the expansion of the waterfront to accommodate lumber and railroad interests, it has been determined to not be archeologically sensitive; there is no native soil underneath the building.

2.2.2 Federal Section 106 and State 22 VSA Compliance

The Moran Plant Historic District was listed in the National Register of Historic Places in 2010. The National Register is the official list of properties of local and State signficiance in American history, architecture, archaeology, engineering, and culture that are worthy of recognition and preservation. It is maintained and expanded by the National Park Service on behalf of the Secretary of the Interior. The National Register documents the appearance and importance of districts, sites, buildings, structures, and objects significant in our prehistory and history. Such recognition qualifies for certain federal tax provisions and state grants and, if a project has federal funding, there must be the opportunity for comment by the state and federal historic preservation staff.

Demolition of the Moran Plant would have a 'significant impact' on the property's ability to convey its physical integrity and historical and architectural significance. Therefore, certain documentation and mitigation would be needed to satisfy federal requirements. The City of Burlington also has requirements when modifying buildings of local significance.

This section of the report summarizes the issues at the federal and state levels for advancing demolition of this building as it relates to the historic and architectural significance of the building. Implications of significance on permitting can be found in the Local Regulatory Requirements section. Next steps and general costs associated with documentation and mitigations are also provided in Section 4.

In many ways, federal and state compliances are similar and thus are summarized below.

2.2.2.1 Federal Section 106 Compliance

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665 U.S.C. 300101) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, "Protection of Historic Properties" (36 CFR Part 800), must also be considered. This review must be conducted when federal funds are used in a project involving properties listed in or determined eligible for the National Register of Historic Places.

If Section 106 covers the proposed project, a geographic area of potential effect is identified which must be evaluated to ascertain if properties will be adversely affected. The federal agency (whichever is involved in funding the project) or its delegate is responsible for consulting with the State Historic Preservation Office (SHPO) and/or Tribal Historic Preservation Office (THPO) and other consulting parties when making the identifications.

If the federal agency or its delegate finds that historic properties are present, it proceeds to assess possible affects to the historic resources and explores ways to avoid or mitigate adverse effects.

2.2.2.2 State 22 VSA Compliance

The State of Vermont also has requirements for historic properties. The Vermont Historic Preservation Act was established in 1975 by the Vermont Legislature with the passage of Title 22 V.S.A. Chapter 14: Historic Preservation. The Act directs the State Historic Preservation Officer to cooperate with federal, state, and local government agencies in the planning and conduct of specific undertakings affecting historic properties and preservation objectives, and in the implementation of federal and state laws pertaining to local and regional planning and development, land use planning, and environmental protection.

If a project is to or has received state funding, the granting state agencies must consult the Vermont Advisory Council on Historic Preservation before demolishing, altering or transferring any property that has historical, architectural, archaeological and/or cultural significance, including any property listed in the State and/or National Registers of Historic Places. It is the responsibility of the granting state agency to initiate consultation with the Vermont Division for Historic Preservation (VDHP) and fulfill the requirements of 22 V.S.A. Chapter 14. The City of Burlington would be invited to participate as an interested party.

For projects that are subject to review under 22 V.S.A., project review by VDHP consists of evaluating the project's potential impacts to historic buildings and structures, historic districts, historic landscapes and settings, and known or potential archaeological resources.

Like in Section 106 compliance, under 22 V.S.A., VDHP has the opportunity to comment, make a determination of effect to the resource and then work to outline the measures needed to avoid, minimize, or mitigate the adverse effects. VDHP is charged with providing final concurrence on the proposed undertaking.

2.2.2.3 Assess adverse effects

For both federal and state compliances, an assessment of adverse effects on the identified historic properties based on criteria must be made. If there is a determination of **no adverse effect,** the undertaking proceeds with any agreed-upon conditions.

If there is a finding that there is an **adverse effect,** or if the parties cannot agree, the federal or granting state agency begins consultation to seek ways to avoid, minimize, or mitigate the adverse effects.

2.2.2.4 Resolving Adverse Effects

The federal or granting state agency consults to resolve adverse effects with others, who may include local governments, permit or license applicants, and members of the public. Consultation usually results in a Memorandum of Agreement (MOA), which outlines agreed-upon measures that will avoid, minimize, or mitigate the adverse effects. In some cases, the consulting parties

may agree that no such measures are possible, but that the adverse effects must be accepted in the public interest. If an MOA is executed, the undertaking proceeds under the terms of the MOA. More information on Section 106 compliance can be found at: http://www.achp.gov/106summary.html

2.2.3 Moran Plant: Compliance with Federal and State Historic Preservation Regulations

From the studies conducted, the Moran Plant is historically and architecturally significant, and federal and state funding has been utilized for the site stabilization and environmental remediation over the years. Thus, the appropriate federal and state authorities must be given the opportunity to comment on any plans to demolish the building. The key point of first contact for this would be SHPO for the State of Vermont. CEDO has already reached out to discuss demolition options with the SHPO and shall continue discussions as a redevelopment plan is determined by the City. The City also has regulations that cover impacts to historic resources. A summary of the various regulations and requirements for federal, state and local compliance is described below along with estimated costs for mitigation.

CEDO has been in touch with the SHPO for the past several months discussing the potential demolition and reached out to federal agencies that we have received funding from in the past to alert them to the work in both redevelopment and potential demolition for the Moran Plant and associated lands. Per recommended best practices, the City wanted to begin discussion early to be able answer questions, comply with any requirements, and understand any mitigation that might be required. The main focus of consultation would be the building itself, as archaeological impacts would not be a concern because the site is built on infill material and demolition would limit any excavation as the existing foundation will be reused, thus greatly reducing potential disturbance of the subsurface.

If the City moved forward with any demolition, a summary of the undertaking would need to be supplied to the SHPO and federal agencies, and any final MOU agreed upon. However, preliminary conversations have provided important next steps. Per the SHPO, there are adequate records through the traditional means of documentation (i.e. original blueprints, the 2010 National Register nomination, photographs, the Assessment Report by New England Preservation Collaborative, and the archaeological report by UVM-CAP, BED 100-year history, etc.) and thus there is no need for mitigation in the form of additional documentation. Instead, the SHPO would like to explore the idea of a public format for that documentation, such as a publication that addresses the history of the site and building, and history of the generation of electricity in Burlington, similar to a publication produced following the demolition of resources at the Elizabeth Mine. Such a publication would require compiling the existing information from the assessment, nomination, and archaeology reports and using original blueprints and photographs, historic and present. A publication like this would be estimated to cost $5,000 to 8,000 depending on length and number printed. There would also be a cost for a consultant to draft and prepare the publication between $5,000 and $7,000. These costs are included in the overall demolition estimates. The SHPO would also like to see a distribution plan and website presence for the publication outlined as part of the mitigation. An application for removal of the Moran Plan from the National Register of Historic Places would be submitted after demolition.

2.2.4 Moran Plant: Compliance with Local Historic Preservation Regulations

The Moran Plant is listed on the State and National Register of Historic Places and considered an historic building that is subject to Section 5.4.8 of the zoning ordinance (Historic Buildings and Sites). As such only the Development Review Board (DRB) can approve demolition of a historic structure pursuant to the provisions for Conditional Use Review as well as the additional standards for review of demolition for a historic building.

According to those standards the time between the end of demolition and the beginning of new construction generally shall not exceed 6 months except where the property is to be deed restricted to remain open space and/or recreational use. If the City is not prepared to commit to any given redevelopment concept, the City could simply seek a zoning permit for demolition of the building and completion of the Corrective Action Plan to be approved by VTDEC and EPA. This would include removal of the building and a cap most likely to include a geotextile barrier and clean fill with the establishment of turf.

The City will need to present a strong case for demolition providing for mitigation of the adverse impacts of demolition and including Historic American Building Survey (HABS) documentation. It will also need to show that the Moran Plant cannot be rehabilitated or reused on site as part of any economically beneficial use of the property, in conformance with the underlying zoning district, and that demolition will provide a substantial communitywide benefit that outweighs the Moran Plant's historic or architectural significance.

The regulations also encourage applicants to sell or reclaim a structure and historic building materials. However, given the environmental contamination of the building, it would not be safe to sell such material.

2.3 Environmental Considerations

2.3.1 Summary of Assessment, Remediation, and Corrective Action Planning Activities

The City contracted with The Johnson Company (JCO), which has extensive experience and knowledge about the Moran Plant to provide a document review of the environmental status of the Moran Plant for this section of the demolition report. Their full memorandum is in the Appendix Section 5.10. This information is intended to provide a basis to better understand the environmental concerns associated with the building in order to evaluate various demolition scenarios for the Moran Plant. Understanding the environmental challenges is important as they significantly influence the cost and timeline of each scenario.

The information provided in this section is based on a review of the following reports, with an emphasis placed on more recent documents:

- Waite Environmental Management, LLC, *Groundwater Monitoring Report & Interim Corrective Action Plan, Moran Generating Plant,* March 13, 2007, revised May 7, 2007.

- Waite Environmental Management, LLC, *Corrective Action Plan for Building Cleanup, Moran Plant*, March 11, 2009, revised March 17, 2009.
- Lincoln Applied Geology, Inc., *Moran Plant Rehabilitation*, October 22, 2009.
- The Johnson Company, *Remediation Report, Moran Plant Project*, January 10, 2011.
- Letter from Waite Environmental Management, LLC to VT DEC, re: Sediment and Water Sampling Results, December 22, 2010.
- Waite Environmental Management, LLC and The Johnson Company, *Report on Supplemental PCB Sampling of Basement Concrete Floor, Moran Generating Plant*, February 16, 2011; revised, March 16, 2011.
- Waite Environmental Management, LLC, *Transformer Yard Subsurface Investigation Report, Moran Generating Plant*, February 17, 2011; revised March 17, 2011.
- Waite Environmental Management, LLC, *Corrective Action for Moran Center and Waterfront Access North, 475 Lake Street*, August 24, 2011.

The following provides a summary of the more significant events related to the environmental history of the Moran building. Note that the events summarized below are relevant only to the interior of the building – exterior investigations, corrective actions, remediation were conducted outside the building during this timeframe which are not summarized as they have limited relevance to the scope of this effort.

2.3.2 Testing and Mitigation

The Moran building was historically used for industrial power generation and left a legacy of environmental impacts that require remediation. Through previous environmental assessment the following contaminants were identified that would require management and/or remediation during redevelopment and now should be part of any considerations regarding demolition:

VOC: Volatile Organic Compounds
PCB: Polychlorinated biphenyl
PAH: Polycyclic aromatic hydrocarbons
ACM: Asbestos-containing material
Metals: lead, arsenic, chromium, and mercury

2.3.3 Past Mitigation Efforts

Below is a timeline of major environmental remediation efforts:

2009

- The sluice gate, which formerly connected the building basement to Lake Champlain, was permanently sealed with subaqueous grout in response to concerns that potential contaminants in the building basement may be migrating into the lake.
- A cleanup of the building interior was conducted and additional asbestos testing was conducted, which found five new ACM. This cleanup consisted of:

- Pumping, filtering, settling, and disposal of 342,150 gallons of water from the basement level
- Removal of 4 tons of bird guano from the building interior
- Removal of 475 tons of debris and scrap metal
- Removal of 8 cubic yards of lead paint waste
- Removal of 1400 ft^2 of asbestos-containing window caulk and hard board

2010

- A second interior clean-up was conducted. This remedial effort included the removal and appropriate disposal of interior water and impacted basement sediment identified during the 2008 sampling event. Specifically, the removal action consisted of:
  - Removal of approximately 1,000 to 1,500 pounds of loose ACM debris from the basement
  - Removal of 60 cubic yards of sediment (disposed as Resource Conservation and Recovery Act (RCRA) hazardous waste) from the basement floor, generator pits, and ash trenches.
  - Disposal of approximately 30,000-gallons of water from the basement

2.3.4 Exterior assessment and remediation

Between 2006 and 2016 numerous soil and groundwater investigations took place around the grounds of the Moran Plant for various projects, including the construction on the Waterfront Access North (WAN) project. Because the bulk of the data collected during these investigations is not relevant to the building demolition, these activities are not summarized individually. However certain information, summarized below, may be relevant if demolition of the building below ground surface is undertaken:

- Groundwater levels vary seasonally, but are generally less than 5 feet below ground surface
- The typical soils below the water table are “flowing sands”, meaning that the flow of water into an excavation advanced below the water table destabilizes the sand and causes the walls of the excavation to become unstable and collapse.
- The groundwater in the vicinity of the Moran plant, particularly north of the building, may be impacted with chlorinated and/or petroleum VOCs. However, it should be noted that Vermont Deptartment of Environmental Conservation (VTDEC) is requiring no additional groundwater investigation and authorized the decommissioning of monitoring wells in 2013. If deeper demolition, requiring dewatering, is undertaken, then the water may need to be treated before discharge.
- The upper strata of soil in the vicinity of the Moran plant are impacted with PAHs, arsenic, and possibly petroleum VOCs. Any soils disturbed during demolition that cannot be re-used onsite will need to be transported off-site for disposal at an approved receiving facility. Based on the results of the WAN project, the soil is likely suitable for disposal as “alternative daily cover”
- No soil or groundwater quality data exists for the zone immediately below the building.

PCB remediation occurred in the former transformer switch yard in an area immediately to the southeast of the building. Although the majority of PCB impacted concrete and soil was removed, some inaccessible concrete remains buried in place at depth.

2.3.5 Discussions with Regulators

Just as the previous potential redevelopment efforts required engagement with various state and federal agencies, so will any demolition effort. The City anticipates at a minimum, engagement with the VTDEC and the U.S. Environmental Protection Agency (EPA) to amend the Corrective Action Plan (CAP) to reflect the demolition proposal. These agencies would also be engaged if additional assessment is required due to unanticipated findings and to review plans that require agency approval before demolition activities can begin. Other possible regulators could be, but are not limited to, the Vermont Division of Historic Preservation, U. S. Army Corp of Engineers, Vermont Department of Health, and the Vermont Agency of Natural Resources.

2.3.6 Federal Level - U.S. Army Corps of Engineers

Depending on which demolition scenario is advanced, the City would coordinate with the Corps to obtain the appropriate approvals. This is most likely in relation to removing the foundation which could potentially alter the dammed sluice ways to ensure the waters of Lake Champlain are protected.

Several key documents related to the known environmental concerns would need to be developed prior to demolition. These include the following:

- ***Corrective Action Plan Addendum***: An addendum to the 2011 CAP will be required, because building demolition was not considered as an alternative in this CAP. The degree of modification required to the CAP will be dependent on the selected demolition scenario. It is anticipated that the greater the depth of demolition, the more modification to the current CAP will be required.
- ***Additional Assessment Reports:*** If additional environmental assessment is required, reports documenting the work will need to be prepared and submitted to the VTDEC for review. It is anticipated that this reporting will be limited to those analyses required to address the sediment in the sub-channels (as needed), any additional PCB analyses required (likely under Scenario 4, only), and all pre-demolition waste stream analyses of building materials (i.e. lead paint, ACM, and PCB). It is possible that these assessment reports could be incorporated into the CAP Addendum.
- ***Waste Stream Disposal Profiles:*** Disposal profiles for the waste stream(s) will need to be prepared and submitted to the receiving facility for review and approval.

2.4 Local Regulatory Requirements

Demolition of the Moran Plant will require a zoning permit and a building permit for disconnection of the electrical service at the building. Many of the zoning requirements will be straight forward and would apply to most projects. However, the request to demolish a historic structure and related time frames and limitations for future development of the site are the most

relevant to this discussion. Information on local requirements for demolition of a historic structure can be found in Section 2.2.4. The permitting process and relevant zoning regulations that may apply are outlined below, with detail regarding their specific content found in Appendix Sections 5.2 – 5.4 .

2.4.1 City Permitting Process, Regulations & Fees for Demolition

Permitting for demolition and redevelopment would happen concurrently through a Certificate of Appropriateness Level II application. The following requirements would need to be met:

1. Pre Application Conferences
    a. Administrative Conference
    b. Technical Review Committee
    c. Sketch Plan Review
2. Certificate of Appropriateness (COA) Level II and Conditional Use applications
3. Design Advisory Board and/or Conservation Board
4. Development Review Board
    a. Conditional Use review
    b. Review of demolition for a historic building
    c. Site plan and design review (COA Level II)

Below is a summary of the City regulations and fees that would apply to demolition.

- ***Local Zoning Permit & Impact Fees:*** Certificate of Appropriateness (COA) level II review for demolition alone and does not include the cost of an as yet determined redevelopment project:
    - *Application Fee:* 1. $110 and; $2 / $1,000 of estimated construction cost
    - *Development Review Fee:* $4.50/$1,000 of estimated construction cost (total would be $6,500 per $1 million in cost)
    - *Conditional use application fee (if nonconforming)***:** $150

- ***Zoning:*** Downtown Waterfront – Public Trust District (Sec. 4.4.1 Burlington Comprehensive Development Ordinance)

- ***Dimensional Standards:***
    - Demolition of a Nonconforming Structure (Section 5.3.5 Burlington Comprehensive Development Ordinance)
    - COA Level II Application (Section 3.2.2 Burlington Comprehensive Development Ordinance)
    - Additional application requirements for demolition for a historic building (Section 5.4.8 Burlington Comprehensive Development Ordinance)

- **Review Standards**
    - Conditional Use Review Standards (Section 3.5.1 Burlington Comprehensive Development Ordinance)

    - Standards for review of demolition for a historic building (Section 5.4.8 Burlington Comprehensive Development Ordinance)

- **Stormwater and Erosion Control**
    - Standard Erosion Prevention & Sediment Control (EPSC) Plan (Ord. of 12-15-08(2), § 26-3-15)
    - Stormwater Management Plan (Ord. of 12-15-08(2), § 26-3-26)

- **DPW/ISD Permit & Plans Review Process:** Vermont 2015 Fire & Building Safety Code

For a permit allowing for demolition, the guidelines surrounding required construction documents are outlined in the building code Section 7 Application for a Construction Permit.

2.5 Demolition and Deconstruction of the Moran Plant: Options & Cost Estimates

2.5.1 Cost Estimates

The City contracted with The Johnson Company (JCO), as they have extensive experience and knowledge of the Moran Plant and surrounding site that was needed to develop and evaluate costs associated with four demolition scenarios for the Moran building. This section includes information on the consultant's qualifications and scope of work, the four demolition scenarios, and the process for developing the cost estimates, summaries of estimates and checklist.

2.5.2 Consultants

JCO has been in business since 1978 with a specialized team of environmental and civil engineers, geologists, hydrogeologists, hydrologists, chemists, and biologists that provides a multi-disciplinary and comprehensive approach to solve environmental challenges cost-effectively. JCO worked with a team of three subcontractors that each have specialized skills and experience directly applicable to the proposed demolition of the building and management of its contents. JCO retained highly qualified subcontractors (Accuworx, Casella Construction, and Clay Point Associates) with local experience and specific expertise to develop appropriate means, methods, and associated cost estimates for demolition. A description and the role of each of the three subcontractors is provided below.

- ***Accuworx USA, Inc. of Barre, Vermont*** is a hazardous waste removal, transport, and disposal business that specialize in remediation of contaminated sites. Accuworx focused on the costs for removal and disposal of all hazardous waste, including sediment, abandoned electrical equipment, universal waste, and concrete that cannot be accepted at solid waste landfill.
- ***Casella Construction of Mendon, Vermont*** is a heavy construction firm that has recent experience successfully performing large demolition projects in New England. This demolition experience includes the following projects: Killington Peak Lodge, Waterbury State Office Complex (Phase I and Phase III), Philipo Dry Cleaner, Newport Spates

Block/ Downtown, Rutland Plywood, UVM Chittenden, Buckham, and Wills, UVM Angel Hall, UVM Cook Physical Science Building, Ascutney Mountain Base Lodge, and VELCO East Fairfax Substation. Casella focused on generating costs associated with the demolition, transport, and recycling/disposal of all building materials that do not require management as hazardous waste.

- ***Clay Point Associates of Williston, Vermont*** is an environmental consulting firm that specializes in abatement design, management, and closure reporting for properties whose redevelopment is complicated by the presence of asbestos-containing material, lead based paint, and PCB containing building materials. Clay Point focused on developing costs for additional asbestos, lead paint, and PCB building material inspection, subsequent abatement, and disposal of these materials. Included in Clay Point's scope was a limited asbestos inspection that preliminarily evaluated concrete, cement block/mortar, brick/mortar and other cementitious or rigid building materials for asbestos content. Additionally, Clay Point provided lead based paint screening activities, toxicity characteristic leaching procedure analysis, and an evaluation screening of PCBs in painted surfaces.

JCO served as a facilitator to this team and provided coordination, project management, and direction to prepare an estimate for CEDO and the public. Furthermore, JCO incorporated the estimated demolition costs for each of the four demolition scenarios.

2.5.3 Process

The consultant team had an initial meeting with CEDO and CEDO consultant, Ken Braverman, to outline the scope of work for developing the estimates. The team made several site visits to the Moran Plant. CEDO provided the team original blueprints and other materials that were used to develop appropriate quantities for the estimates. The team met with CEDO several times to refine the estimates and ensure there was no duplication of costs between subcontractors. Although a significant amount of environmental due diligence has been performed at the Moran building, all the information necessary to generate an exact cost estimate is not available. Therefore, CEDO had Clay Point Associates do some additional limited testing for asbestos, lead paint and PCBs to further narrow the assumptions and ranges in cost. This additional testing confirmed that the concrete was free of asbestos, coated surfaces generally do not contain lead-based paint, but most coated surfaces do contain PCBs. Without this information, inaccurate assumptions may have been made or the range in costs would have been so broad that the estimates would provide little value from a planning perspective. Additional and more definitive testing will likely still be required to further narrow the range of costs and the potential uncertainties presented by such an environmentally challenged and complex demolition project. The estimates do not include any redevelopment costs.

2.5.4 Demolition Options

The following four demolition scenarios have been considered and cost estimates prepared for each scenario. Under each hypothetical scenario, the above current grade portion of the current building would be demolished. The scenarios differ based on how much of the sub-grade structure is demolished and disposed of as construction debris or recycled. The scenarios range

from demolition of only above grade portions of the building (Scenario 1) to complete demolition and removal of the entire sub-structure including, foundation, footers, slabs, and sub-basement channels (Scenario 4). Under all scenarios the void created after demolition would be backfilled with clean structural fill.

- *Scenario 1:* building would be demolished to current grade, (approximately 103 feet above sea level (fasl);
- *Scenario 2:* building would be demolished to a depth of 2-feet below current grade (101 fasl);
- *Scenario 3:* building would be demolished to a depth of 96 fasl (assumed current elevation of lower basement floor); and
- *Scenario 4:* building would be demolished to a depth of 86 fasl, which would include the removal of concrete footers, foundations, and subsurface structure.

2.5.4.1 Scenario 1: Removal of All Building Materials above 103 fasl (Current Ground Surface)

This option involves demolition of the building superstructure to the current ground surface. The basement would then be backfilled with appropriate fill consistent with the redevelopment goals. If the redevelopment is construction of a replacement building, then the basement will need to be partially-backfilled with clean structural fill and a vapor intrusion mitigation system installed. Additionally, the sediment in the sub channels will need to be addressed in manner that prevents the potential impact of surrounding groundwater by either sequestering the contaminated sediment in place or removal and offsite disposal.

Moran Plant Demolition Scenario 1 - Summary

	Low Cost Estimate	**High Cost Estimate**
Demolition	$ 2,662,013	$ 3,117,594
Asbestos/ LBP / PCB Building Materials	$ 229,942	$ 763,143
Transportation and Disposal of Additional Remediation Waste	$ 23,536	$ 36,887
Qualified Environmental Professional Services	$ 128,810	$ 202,760
Resident Engineering Services	$ 68,950	$ 113,300
Additional Expenses*	$ 870,523	$ 1,181,283
	$ 3,983,773	**$ 5,414,966**

*includes historic preservation compliance, administration by city staff, preparation of demolition bid package, permitting fees and contingency.

Time frame for completing remediation and demolition: 4 months - assuming 6 days/wk @ 10 hr/day (This does not include pre deconstruction activities or permitting)

2.5.4.2 Scenario 2: Removal of All Building Materials above 101 FASL (2-Ft below Current Ground Surface)

This option involves demolition of the building superstructure to a depth of two feet below current ground surface. As with Scenario 1 above, the basement would then be backfilled with appropriate fill consistent with the redevelopment goals, and sediment would need to be appropriately managed. If the redevelopment is construction of a replacement building, then the basement will need to be partially backfilled with structural fill and a vapor intrusion mitigation system installed. This demolition scenario will be more expensive than Scenario 1, because additional material will require removal and disposal. It is considered unlikely that the degree of disturbance required to remove the building to 2-feet below ground surface will result in the need for soil disposal or dewatering and treatment.

Moran Plant Demolition Scenario 2 - Summary

	Low Cost Estimate	High Cost Estimate
Demolition	$ 2,853,008	$ 3,318,139
Asbestos/ LBP / PCB Building Materials	$ 230,747	$ 718,587
Transportation and Disposal of Additional Remediation Waste	$ 23,536	$ 38,330
Qualified Environmental Professional Services	$ 156,375	$ 241,525
Resident Engineering Services	$ 82,450	$ 135,800
Additional Expenses*	$ 932,727	$ 1,237,853
	$ 4,278,843	**$ 5,690,235**

*includes historic preservation compliance, administration by city staff, preparation of demolition bid package, permitting fees and contingency.

Time frame for completing remediation and demolition: 5 months - assuming 6 days/wk @ 10 hrs/day (This does not include pre deconstruction activities or permitting)

2.5.4.3 Scenario 3: Removal of All Building Materials Above 96 Fasl (Assumed Basement Floor Elevation)

This option involves demolition of the building to the level of the basement floor (approximately 96 fasl). At that point, walls and a structural slab could be poured for a new building or the excavation could be backfilled. The advantage of this option is that the remaining large concrete objects would be at depth and would be less likely to interfere with redevelopment, should a new building with new foundation be approved in the footprint of the former building. The down-side of this option is that given the groundwater elevation is typically above the basement floor level and the sandy nature of the soils around the Moran Plant, it is likely that dewatering and groundwater treatment would be required to complete the excavation. In addition, the deeper concrete removal effort of building foundation walls would result in a much greater volume of material requiring disposal. Furthermore, there is a greater likelihood that soils would be encountered that are unsuitable for re-use from a structural and/or environmental perspective,

therefore requiring off-site disposal. Soil stockpiling and management may also be required depending on the sequencing of demolition.

Moran Plant Demolition Scenario 3 - Summary

	Low Cost Estimate	High Cost Estimate
Demolition	$ 3,322,423	$ 3,811,026
Asbestos/ LBP / PCB Building Materials	$ 230,747	$ 604,392
Transportation and Disposal of Additional Remediation Waste	$ 23,536	$ 46,993
Qualified Environmental Professional Services	$ 179,165	$ 268,705
Resident Engineering Services	$ 95,950	$ 158,300
Additional Expenses*	$ 1,072,126	$ 1,356,830
	$ 4,923,947	**$ 6,246,245**

*includes historic preservation compliance, administration by city staff, preparation of demolition bid package, permitting fees and contingency.

Time frame for completing remediation and demolition: 6 months - assuming 6 days/wk @ 10 hrs/day (This does not include pre deconstruction activities or permitting)

2.5.4.4 Scenario 4: Removal of All Building Materials Regardless Of Depth

This option involves demolition and removal of all building materials associated with the Moran building, including the basement floor and any footers or foundation blocks. This option gives the most flexibility in terms of redevelopment, as no sub-surface impediments will remain. However, this option will require a significant dewatering effort given that the work will be taking place 10-feet or more below the water table and off-site soil disposal is more likely to be required due to the extensive soil disturbance required. In addition, soil would likely need to be stockpiled and managed on-site during the demolition. Lastly, there are significant uncertainties associated with this scenario which include:

1. Soil or groundwater quality assessments beneath the building have not been conducted and although unlikely a wide variety of contamination affecting various media could potentially exist beneath the slab, having significant cost and schedule implications;

2. Considering PCBs were found in the basement concrete floor at concentrations of up to 15 ppm, although unlikely, the potential exists for more extensive PCB impacts below the building. If PCB concentrations were identified that exceed the 50 ppm hazardous threshold significant cost and schedule implications would be expected; and

3. Considering the depth of excavation required and the assumed thickness of the basement floor, foundation, and footers is uncertain, the potential for complications and unrealized costs to implement Scenario 4 are likely to be significant.

Moran Plant Demolition Scenario 4 - Summary

	Low Cost Estimate	High Cost Estimate
Demolition	$ 5,999,595	$ 6,622,056
Asbestos/ LBP / PCB Building Materials	$ 230,747	$ 604,392
Transportation and Disposal of Additional Remediation Waste	$ 218,463	$ 540,309
Qualified Environmental Professional Services	$ 255,905	$ 397,785
Resident Engineering Services	$ 136,450	$ 225,800
Additional Expenses*	$ 1,904,070	$ 2,326,319
	$ 8,745,230	**$ 10,716,661**

*includes historic preservation compliance, administration by city staff, preparation of demolition bid package, permitting fees and contingency.

Time frame for completing remediation and demolition: 9 months – assuming 6 days/wk @ 10 hrs/day (This does not include pre deconstruction activities or permitting)

3 New Construction after Demolition

In considering any plans for new construction after demolition above and beyond the corrective action plan requirements (e.g. liner, clean fill, grass), the City must analyze the potential uses of the site and ensure they comply with both the definition of public use as defined by public trust restrictions on the land as well as local zoning requirements. Public Trust applies as the land was purchased by the City after the area was found to be held in public trust by the Supreme Court of Vermont. In short, public use requires that the public has access to the facility and that it serves a public purpose.

The regulations for demolition of a historic building also affect the timing of any new construction, requiring it be started within 6 months of the completion of demolition. This would allow any new construction to maintain the nonconforming dimensions of the Moran Plant, so a new structure could be built on the same foot print at the same set back from the Lake and the same volume and/or height of the previous structure. This timing constraint would require careful planning of the pre development and permitting processes, including a selection process for development of proposals.

See Section 2.4 for a detailed list of the applicable requirements for demolition. Additionally the new construction would trigger the major impact review requirements, and require payment of an impact fee. The regulations that are specific to the new construction aspect are outlined below.

3.1 Public Trust Restrictions

Public Trust Doctrine is an ancient one, having its roots in the Justinian Institutes of Roman law. When the railroad was allowed to fill in the harbor to extend the lakeshore and accommodate a rail siding in the 1800's, this doctrine came into play as the land below the low water mark has been recognized as being held by the people in trust for public uses.

In the late 1980's, in response to efforts by Central Vermont Railway (CVR) to sell the 1.1 mile strip of filled lands lying along the City of Burlington's Waterfront to a real estate developer, the City and the State challenged CVR's title in the Chittenden Superior Court, invoking the Public Trust Doctrine (State v. Central Vermont Railway, Inc 153 Vt. 337,339 (Vt. 1989)). The court concluded that CVR has fee simple title to the parcel at issue but held that the land must always be used for a public purpose.

The City then acquired the majority of these lands and decommissioned a petroleum tank farm, while the Supreme Court ordered the State Legislature to redefine the Public Trust Doctrine to adapt to current needs. Any changes in Public Trust need to be approved by the State legislature, and meet the dictates of the Supreme Court ruling.

3.1.1 Current Definition of Public Trust

Uses permitted in the public trust district are limited to those uses specifically authorized by the Vermont General Assembly by legislative act. These regulations are enacted under the

provisions of §4411 as amended, Act No. 274 (1988, VT. Adj. Sess.), Act No. 53 (1991), Act No. 87 (1996, VT. Adj. Sess.) and Act No. 22 (1997). (see Public Trust – State Acts Defining Public Use)

1990 - H.890 authorize Burlington to acquire filled public trust land for

1991 – H.233 Use of filled public trust lands on Burlington Waterfront

1996 – H.788 Public Trust Lands / Burlington (Only applies South of Main North of Maple St.)

1997 – H.326 no. 22. An act relating to approving additional public uses for public trust lands located in Burlington harbor (Only applies South of Main North of Maple St.)

3.1.2 Amending public use definition under the public trust doctrine

For any proposed use not currently allowed under current public trust rules in the area including the Moran plant, the state legislature would have to authorize it. Lands held subject to public trust must be used only for purposes approved by the legislature as public uses. Any substantial change in lands held subject to public trust must be consistent with a legislative grant or mandate, subject to judicial review, and this legislative control cannot be delegated to others.

In order to amend the state statute regarding public use, as has been done in the past, a bill to amend the public use definition would have to be drafted and find a sponsor in legislative session. This proposed bill would then have to go through the committee process in both the house and senate and be ratified by the Governor.

3.2 City Permitting Process, Regulations & Fees for New Construction

Demolition and new construction would take place through a single COA level II permit process that would include all aspects of demolition and the major impact review for any new construction. Additionally, regulations for a nonconforming structure come into play and significantly affect any potential new development of the site. Impact fees would need to be calculated according to the formula for any new construction.

3.2.1 Nonconforming Structure Regulations and Effect on Timeline

The Moran Plant is considered a nonconforming structure, meaning its dimensions are not consistent with current zoning requirements. A nonconforming structure may be replaced by a new structure retaining the same degree of nonconformity as the original structure within the allotted time window. This provision is limited to the existing dimensional nonconformity (i.e. setback, lot coverage, or height), and shall not expand the degree of nonconformity.

Under the standards for demolition of a historic building the time between completion of demolition and commencement of new construction shall not exceed six (6) months. This regulation takes precedence over the nonconforming use regulation that a replacement structure must be completed within a year of demolition if any nonconforming dimensionality is to

remain. If new construction is not started within the 6 month timeline, it will be limited to 35 ft. in height and a 50 ft. set back requirement of the current zoning, resulting in considerable loss of redevelopment potential. This would require careful planning of the pre development and permitting processes.

3.2.2 City Permitting Process

Permitting for demolition and redevelopment should happen concurrently through a COA Level II application. Pre application conferences would apply for this project due to any large-scale redevelopment of the site triggering Major Impact Review. Additionally, section 5.4.8 of the zoning ordinance (Historic Buildings and Sites) states that demolition of a historic structure shall only be approved by the Development Review Board (DRB) pursuant to the provisions for Conditional Use Review as well as the additional standards for review of demolition for a historic building.

The following requirements would need to be met as follows:

1. Pre Application Conferences
    a. Administrative Conference
    b. Technical Review Committee
    c. Sketch Plan Review
    d. Pre-application Neighborhood Meeting (if replacement structure is over 10,000 sf.)
2. Certificate of Appropriateness (COA) Level II application
3. Design Advisory Board and/or Conservation Board
4. Development Review Board
    a. Conditional use review
    b. Review of demolition for a historic building
    c. Major impact review
    d. Site plan and design review (COA Level II)
5. Stormwater and Erosion Control
6. Dept. of Public Works (DPW) /Inspectional Services Dept. (ISD) Permit & Plans Review Process

Additional regulations and fees applicable for new construction include the following:

- **Major Impact Review Standards:** found in Section 3.5.1 Burlington Comprehensive Development Ordinance
- **Impact Fee:** found in Section 3 Burlington Comprehensive Development Ordinance

An impact fee would also be charged. This fee is charged against new development to help offset the costs of new infrastructure required by the City's growth. See Impact Fee Calculator.

4 Checklist of Actions, Potential Funding Sources, and Timeline

This checklist is an aggregate list of the action items pertaining to each section in the report. These items may go into greater detail than the sections themselves regarding the steps necessary to move the project forward but is by no means comprehensive. In many instances the scenario chosen will reveal additional requirements. The checklist is broken into three phases: Pre-Deconstruction, Deconstruction and Demolition, and lastly New Construction (if applicable). These phases need to happen sequentially but many actions may take place simultaneously.

4.1 Checklist of actions

4.1.1 Pre-Deconstruction Checklist

4.1.1.1 Financial Obligations

- ✓ Review all grant agreements and contracts with funders
- ✓ Initiate contact and conversation with funders
    - U.S. Environmental Protection Agency (EPA)
    - U.S. Economic Development Administration (EDA)
    - U.S. Housing and Urban Development (HUD)
    - Vermont Department of Environmental Conservation (VTDEC)
    - Chittenden County Regional Planning Commission's Brownfields program
- ✓ Address and concerns or issues raised by funders
- ✓ Resolve adverse effects to the city

4.1.1.2 Historic Preservation Process

- ✓ Initiate the Section 106 process by consulting first with SHPO
    - Involve groups or individuals with a demonstrated legal or economic interest in the project and those with concerns about impacts to historic properties as a result of the project
    - Decide (in consultation with the SHPO) whether or not to grant consulting party status to groups or individuals who request such status
    - Ideally use the National Environmental Policy Act (NEPA) review process to meet the public process for compliance with Section 106
- ✓ To meet the state requirements Vermont Division for Historic Preservation (VDHP) will be a consulting party charged with advising and assisting the state agency in carrying out their statutory responsibilities
    - Public format for existing historical documentation resources on the Moran Plant
- ✓ Resolving adverse effects
    - Organize and facilitate discussions with the consulting parties about possible measures to minimize or mitigate the adverse effects of the project
    - Sign a MOA, with SHPO, and the ACHP, if participating, and VDHP regarding the measures to mitigate the adverse effects

4.1.2 Environmental Planning

- ✓ Hire Qualified Environmental Professional
  - Amend the Corrective Action Plan with DEC and EPA approval
  - Additional assessments if needed
  - Waste Stream Disposal profiles
  - Confirm plan with USACE depending on demolition scenario that is advanced
  - Assist in Bid Package development for Demolition
  - Participate in pre-bid and pre- demolition meetings
  - Prepare all necessary plans, forms and reports to DEC/EPA /City
- ✓ Ongoing communications during deconstruction with regulators

4.1.3 Deconstruction and Demolition Checklist

- ✓ Identify sources of funding
  - TIF
  - General Fund
- ✓ Hire Qualified Environmental Professional
  - Amend the Corrective Action Plan with VTDEC and EPA approval
  - Additional assessments if needed
  - Waste Stream Disposal profiles
  - Confirm with USACE depending on demolition scenario that is advanced
  - Assist in Bid Package development for Demolition
  - Participate in pre-bid and pre- demolition meetings
  - Coordinate with abatement contractors
  - Prepare all necessary plans, forms and reports to VTDEC/EPA /City
  - Ongoing communications during deconstruction with stakeholders
  - Prepare CAP Completion Report
- ✓ Seek zoning permit
- ✓ Develop Bid Package for Demolition
  - Hire consultants (Engineers, and RE services)
  - Develop plans and specification and bid documents
  - Issue Bid
  - Award Bid
- ✓ City develop contract for demolition contractor with City Attorney review
- ✓ Seek approval of bid award and contract with Board of Finance and City Council
- ✓ Sign contract with General Contractor
- ✓ Coordinate deconstruction activities with adjacent users
  - Burlington Electric Department
  - Burlington Water Resources Department
  - Burlington Parks, recreation and Waterfront Department
  - Lake Champlain Community Sailing Center
  - Burlington Harbor Marina
- ✓ Manage deconstruction project
- ✓ Ongoing communications during deconstruction with stakeholders

4.1.3.1 Permitting for Deconstruction

- ✓ Pre-application Conferences
  - Administrative Conference
  - Technical Review Committee
  - Sketch Plan Review
- ✓ COA Level II application & fees
- ✓ Design Advisory Board and/or Conservation Board
- ✓ Development Review Board
  - Conditional Use review
  - Review of demolition for a historic building
  - Site plan and design review (COA Level II)
  - Stormwater and Erosion Control
- ✓ DPW/ISD Permit & Plans Review Process

4.1.4 New Construction Checklist

4.1.4.1 Pre-Development

- ✓ City to issue RFP for redevelopment of site after demolition
- ✓ Determine if proposals are feasible and meet public use guidelines
- ✓ Public selection process
- ✓ Redevelopment entity due diligence
- ✓ Develop full set of plans required for zoning permit COA Level II review meeting nonconforming use guidelines
- ✓ Develop a timeline for redevelopment including environmental remediation
- ✓ Sign a predevelopment agreement

4.1.4.2 Additional Permitting for New Construction (in addition to Permitting for Deconstruction)

- ✓ Pre-application Neighborhood Meeting
- ✓ Impact Fee
- ✓ Development Review Board
  - Major impact review

4.2 Timeline

These are estimates which could vary depending on which demolition scenario is pursued, additionally new construction timeframes would be dependent upon the scale of the project.

Pre deconstruction activities: 6 – 9 months

- Address Financial obligations
- Historic Preservation Process
- Environmental Planning
- Development of bid package and bid process

Permitting: 3 – 5 months

- Conservation Board
- Design Advisory Board
- Development Review Board
- Demo Permit

Deconstruction

Scenario 1: 4 months - assuming 6 days/wk @ 10 hr/day
Scenario 2: 5 months - assuming 6 days/wk @ 10 hrs/day
Scenario 3: 6 months - assuming 6 days/wk @ 10 hrs/day
Scenario 4: 9 months - assuming 6 days/wk @ 10 hrs/day

New Construction

Pre-Development 1 -2 years

- RFP for redevelopment of site after demolition
- Public selection process

Permitting 3 – 5 months

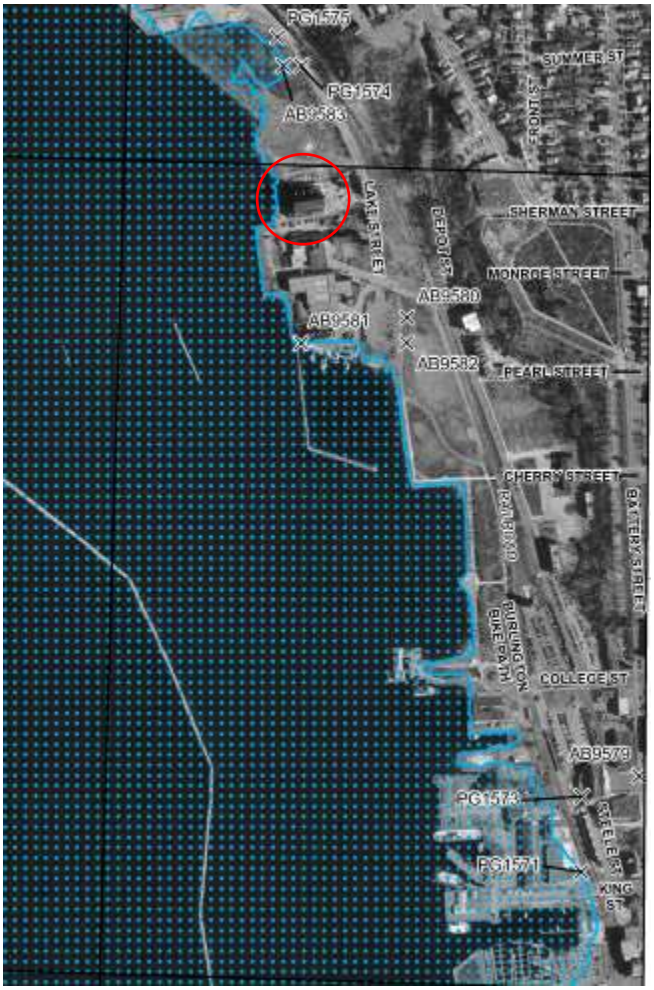
- Conservation Board
- Design Advisory Board
- Development Review Board
- Building Permit

Construction 11 – 18 months

5 Appendix

5.1 Flood Plains Map

FEMA Flood Hazard Map



5.2 Downtown Waterfront - Public Trust Zoning

Section 4.4.1 Burlington Comprehensive Development Ordinance

Public Trust Restrictions: These regulations set forth the permitted uses, identified by the Vermont General Assembly, associated with those parcels within the Downtown Waterfront – Public Trust District (DW-PT), and designated as "filled lands" along the waterfront and which are subject to the public trust doctrine. This district includes all parcels situated on filled public trust lands on the Burlington waterfront north of the centerline of Maple Street extended as illustrated in Map 4.5.4-1. It is further the intent of these provisions to ensure that public trust filled lands are available to the public on an open and nondiscriminatory basis.

Uses permitted in the public trust district are limited to those uses specifically authorized by the Vermont General Assembly by legislative act. These regulations are enacted under the provisions of §4411 as amended, Act No. 274 (1988, VT. Adj. Sess.), Act No. 53 (1991), Act No. 87 (1996, VT. Adj. Sess.) and Act No. 22 (1997).

Permitted Uses: North of Main Street Only the following uses are permitted within that portion of the Downtown Waterfront – Public Trust District (DW-PT) located north of the centerline of Main Street extended:

i. Governmental facilities: such as water and sewer plants; Coast Guard and naval facilities; roads that are accessory and transportation facilities accessory to the uses permitted under this section; or existing roads, and similarly sized extensions of those roads, that service the filled public trust lands and immediately adjacent lands;
ii. Indoor or outdoor parks and recreation uses and facilities including parks and open space, marinas open to the public on a non-discriminatory basis, water dependent uses, boating and related services;
iii. The arts, educational and cultural activities including theaters and museums;
iv. Fresh water and other environmental research activities;
v. Services related and accessory to the uses permitted under subsections (i) through (iv) of this section, including restaurants, snack bars, and retail uses and ancillary parking; only those uses that are subordinate and customarily incidental to the uses listed shall be considered as related and accessory services; and/or
vi. Railroad, wharfing, and storage uses.
vii. Publicly Accessible Restrooms. Any structure larger than 1000 sq. ft. in size, other than roads, parking lots, railroad tracks or recreation paths, shall include publicly accessible restrooms with appropriate exterior signs indicating their availability. The DRB may waive this provision if it so determines that adequate publicly accessible restrooms are available within close proximity.

5.2.1 Dimensional Standards

For the purposes of regulating building height in such a way as to provide vistas of harbor activity within the breakwater area, and to preserve panoramic views along public street - corridors of the mountains and lake, the DW-PT District is further sub-divided into the following

areas as depicted in the figure below, and both are subject to dimensional standards as follows:

1. 35 ft. height limit
2. Max floor area ratio of 2
3. Max lot coverage of 100%

The Lakeshore district is restricted by waterfront setback rules but given the existing non-conforming use encroaches into the required waterfront setback, no additions to or replacement of that structure may further encroach into the required setback beyond the footprint of the existing building. Above the ground floor, additions to or replacement of that structure may encroach into the required setback no farther than the maximum encroachment of the original structure.

A. North of Pearl: Properties beyond 200' of Lake Champlain north of the centerline of Pearl Street extended and west of railroad.

B. Lakeshore: Properties within 200' of Lake Champlain and west of the railroad

5.2.2 Waterfront Setback Detail

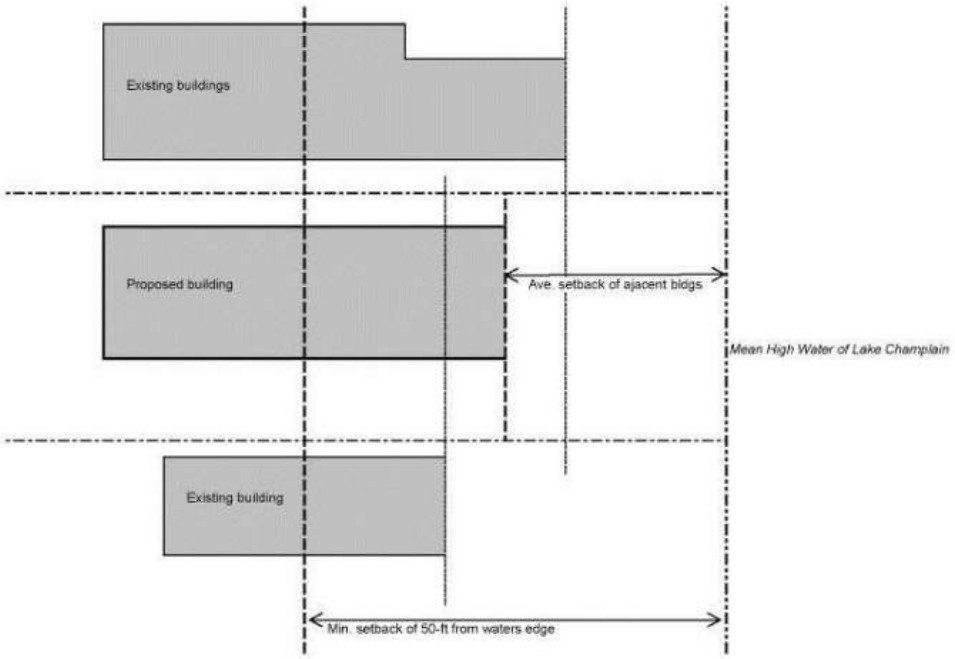
In order to ensure that public trust lands are available to the public on an open and nondiscriminatory basis and the public has continuous and direct access to the water's edge, all buildings shall be setback a minimum of 50-feet from the mean high water mark of Lake Champlain (100-feet above mean sea level) unless an encroachment is authorized.

Additions to Existing Structures

Where a structure, existing as of the effective date hereof, encroaches into the required waterfront setback, no additions to or replacement of that structure may further encroach into the required setback beyond the footprint of the existing building. Above the ground floor, additions to or replacement of that structure may encroach into the required setback no farther than the maximum encroachment of the original structure.

Averaging of Setbacks

If the waterfront setback of principal structures on adjacent lots, existing as of the effective date hereof, within a distance of one hundred fifty (150) feet on either or both sides of a lot encroaches into the waterfront setback, the required setback may be reduced to the average setback of such structures as illustrated in Figure 4.4.1-4.



Permitted Encroachments

The DRB may approve one or more of the following within the required waterfront setback: structures such as walkways, planters, benches, fountains, public art, sitting walls and other improvements which will enhance the pedestrian environment and enjoyment of the waterfront; and public marinas, public recreational piers, ferry docks, lake excursion facilities, and open-air markets, provided pedestrian circulation is not unreasonably impaired.

5.3 Nonconforming Structures Detail

Sec. 5.3.5 Nonconforming Structures (b) Demolition Burlington Comprehensive Development Ordinance

When any portion of a nonconforming structure has been made conforming, it shall not be made nonconforming again except as provided for historic building features pursuant to Sec. 5.2.6(b)(3).

A nonconforming structure may be replaced by a new structure retaining the same degree of nonconformity as the original structure. This provision is limited to the existing dimensional

nonconformity (i.e. setback, lot coverage, or height), and shall not expand the degree of nonconformity except as provided for in (a) above. The new structure shall be subject to conformance with all other dimensional requirements (i.e. setback, lot coverage, and height). Zoning permit application for the replacement structure shall be completed within 1 year of demolition of the nonconforming structure; failure to do so shall result in the loss of the ability to retain the nonconformity.

In all other cases, a nonconforming structure that has been demolished or moved shall not be re-built or relocated in any way other than in full conformance with the provisions of this ordinance. Structures or any portion thereof that are structurally unsound, and are required to be removed by order of the building inspector, may be replaced within the original footprint provided both the requirement to demolish the building is not the result of demolition by neglect and the replacement shall not expand the degree of nonconformity.

5.4 Requirements for Historic Buildings under Local Zoning

Section 5.4.8 Burlington Comprehensive Development Ordinance

5.4.1 Historic Buildings and Sites

The City seeks to preserve, maintain, and enhance those aspects of the city having historical, architectural, archaeological, and cultural merit. Specifically, these regulations seek to achieve the following goals:

- To preserve, maintain and enhance Burlington's historic character, scale, architectural integrity, and cultural resources
- To foster the preservation of Burlington's historic and cultural resources as part of an attractive, vibrant, and livable community in which to live, work and visit
- To promote a sense of community based on understanding the city's historic growth and development, and maintaining the city's sense of place by protecting its historic and cultural resources
- To promote the adaptive re-use of historic buildings and sites

5.4.1.1 Applicability

These regulations shall apply to all buildings and sites in the city that are listed, or eligible for listing, on the State or National Register of Historic Places.

5.4.1.2 Demolition of Historic Buildings

a) The purpose of this subsection is:
b) To discourage the demolition of a historic building, and allow full consideration of alternatives to demolition, including rehabilitation, adaptive reuse, resale, or relocation
c) Provide a procedure and criteria regarding the consideration of a proposal for the demolition of a historic building

d) To ensure that the community is compensated for the permanent loss of a historic resource by a redevelopment of clear and substantial benefit to the community, region or state

5.4.2 Conditional Use Review

Submission requirements for a COA Level II application include the following, as applicable: https://www.burlingtonvt.gov/sites/default/files/u119/COA2checklistAug16.pdf

1. All items required for a COA Level I application as noted in Sec. 3.2.2(c) above;

2. Color rendered elevations of all sides of the proposed building(s) and actual color samples for wall and roof materials. Elevations must show all roof-mounted equipment, ground-mounted equipment, building-mounted signs and/or sign bands, and building-mounted light fixtures;

3. At least two architectural wall cross-sections (one front wall and one side wall), at a scale of 1 inch equals 1 foot, illustrating the relief (e.g. projections and setbacks) of the architectural features shown in the building elevations;

4. At least one color-rendered perspective drawing from a realistic public vantage point showing the proposed building(s) and landscaping after five to seven years of growth;

5. A detailed plan for new landscaping that clearly identifies species by Latin name, readily understood symbol, and common name, and which shows all screening of parking, dumpsters, and ground mounted mechanical/electrical equipment. The landscape plan should be accompanied by a brief statement of the landscape indicating streetscape design; and,

6. Depending on the nature, location, type, use, and/or size of the proposed development, the issuance of a zoning permit may also be subject to additional application, review and submission requirements pursuant to Articles 3, 4, 5, and

8. All site plans and building elevations must be prepared in a professional manner acceptable to the administrative officer.

The issuance of a zoning permit pursuant to Sec 3.2.9 for a COA Level II Application requires review and approval by the DRB pursuant to Sec. 3.2.8, or by the administrative officer pursuant to Sec. 3.2.7, based on conformance with the applicable district use and dimensional standards found in Art 4, parking requirements found in Art. 8, and the applicable Site Plan Review and Architectural Review development standards found in Art. 6. Review of the proposal may also be required by the design advisory board and or/ the conservation board, which provides an advisory report to the DRB.

5.4.2.1 Application for Demolition

For demolition applications involving a historic building, the applicant shall submit the following materials in addition to the submission requirements specified in Art. 3:

a) report from a licensed engineer or architect who is experienced in rehabilitation of historic structures regarding the soundness of the structure and its suitability for rehabilitation
b) A statement addressing compliance with each applicable review standard for demolition;
c) Where a case for economic hardship is claimed, an economic feasibility report prepared by an architect, developer, or appraiser, or other person experienced in the rehabilitation and adaptive reuse of historic structures that addresses: (i) The estimated market value of the property on which the structure lies, both before and after demolition or removal; and, (ii) The feasibility of rehabilitation or reuse of the structure proposed for demolition or partial demolition;
d) A redevelopment plan for the site, and a statement of the effect of the proposed redevelopment on the architectural and historical qualities of other structures and the character of the neighborhood around the sites; and, Elevations, drawings, plans, statements, and other materials which satisfy the submission requirements specified in Art. 3, for any replacement structure or structures to be erected or constructed pursuant to a development plan.

5.4.2.2 Conditional Use Review Standards

Approval shall be granted only if the DRB, after public notice and public hearing, determines that the proposed conditional use and associated development shall not result in an undue adverse effect on each of the following general standards:

1. Existing or planned public utilities, facilities or services are capable of supporting the proposed use in addition to the existing uses in the area;
2. The character of the area affected as defined by the purpose or purposes of the zoning district(s) within which the project is located, and specifically stated policies and standards of the municipal development plan;
3. The proposed use will not have nuisance impacts from noise, odor, dust, heat, and vibrations greater than typically generated by other permitted uses in the same zoning district;
4. The transportation system is capable of supporting the proposed use in addition to the existing uses in the area. Evaluation factors include street designations and capacity; level of service and other performance measures; access to arterial roadways; connectivity; transit availability; parking and access; impacts on pedestrian, bicycle and transit circulation; safety for all modes; and adequate transportation demand management strategies; and,
5. The utilization of renewable energy resources; and,
6. Any standards or factors set forth in existing City bylaws and city and state ordinances;

5.4.2.3 Standards for Review of Demolition.

Demolition of a historic structure shall only be approved by the DRB pursuant to the provisions of Art. 3, Part 5 for Conditional Use Review and in accordance with the following standards:

e) The structure proposed for demolition is structurally unsound despite ongoing efforts by the owner to properly maintain the structure; or,
f) The structure cannot be rehabilitated or reused on site as part of any economically beneficial use of the property in conformance with the intent and requirements of the underlying zoning district; and, the structure cannot be practicably moved to another site within the district; or,
g) The proposed redevelopment of the site will provide a substantial communitywide benefit that outweighs the historic or architectural significance of the building proposed for demolition.
h) And all of the following: The demolition and redevelopment proposal mitigates to the greatest extent practical any impact to the historical importance of other structures located on the property and adjacent properties;
i) All historically and architecturally important design, features, construction techniques, examples of craftsmanship and materials have been properly documented using the applicable standards of the Historic American Building Survey (HABS) and made available to historians, architectural historians and others interested in Burlington's architectural history; and,
j) The applicant has agreed to redevelop the site after demolition pursuant to an approved redevelopment plan which provides for a replacement structure(s).
    i) Such a plan shall be compatible with the historical integrity and enhances the architectural character of the immediate area, neighborhood, and district
    ii) Such plans must include an acceptable timetable and guarantees which may include performance bonds/letters of credit for demolition and completion of the project
    iii) The time between demolition and commencement of new construction generally shall not exceed six (6) months.

This requirement may be waived if the applicant agrees to deed restrict the property to provide for open space or recreational uses where such a restriction constitutes a greater benefit to the community than the property's redevelopment.

5.4.2.4 Deconstruction: Salvage and Reuse of Historic Building Materials.

The applicant shall be encouraged to sell or reclaim a structure and all historic building materials, or permit others to salvage them and to provide an opportunity for others to purchase or reclaim the building or its materials for future use. An applicant may be required to advertise the availability of the structure and materials for sale or salvage in a local newspaper on at least three (3) occasions prior to demolition.

5.5 Major Impact Review

Major Impact Review shall be required for the approval of all development involving:

1. The construction of five (5) or more dwelling units or the creation through adaptive reuse, substantial rehabilitation or conversion of ten (10) or more dwelling units;
2. The creation of five (5) or more lots;
3. The construction or substantial rehabilitation of fifteen thousand (15,000) s.f. or more of gross floor area of non-residential development;
4. Land disturbance involving one acre or more;
5. Site improvements involving fifty (50) or more parking spaces;
6. Site improvements and land development on parcels that contain designated wetlands as regulated pursuant to Article 4, or natural areas of state or local significance as identified in the municipal development plan;
7. Site improvements and land development on parcels seeking a waiver under Article 5, Part 4, Sec. 5.4.9 – Brownfields; or

It is the intent of these regulations through the creation of a major impact review: (b) To ensure that projects of major significance or impact receive a comprehensive review under established criteria; and, (c) To ensure that the city's natural, physical and fiscal resources and city services and infrastructure are adequate to accommodate the impact of such developments, both individually and cumulatively.

5.5.1.1 Submission Requirements

Any development subject to Major Impact Review under this Part shall also include an affidavit or certification documenting that the Pre-Application Public Neighborhood Meeting requirement pursuant to Sec. 3.2.1(d) has been satisfied in accordance with the procedures and requirements set forth by the department of planning and zoning. Pursuant to Sec. 3.2.8(D), the DRB may require the applicant to pay the reasonable costs and fees incident to an independent technical review of the application.

5.5.1.2 Public Hearing Required

Applications involving Conditional Use and Major Impact Review shall require a public hearing pursuant to the provisions of Article 2 to provide an opportunity for public input and comment to the DRB on the proposed use and it's conformity with the review criteria listed below.

5.5.1.3 Review Criteria

The application and supporting documentation submitted for proposed development involving Conditional Use and/or Major Impact Review, including the plans contained therein, shall

indicate how the proposed use and associated development will comply with the review criteria specified below:

5.5.1.4 Major Impact Review Standards:

Before a major impact development may receive approval, the DRB must be satisfied, based on documentation provided by appropriate city agencies, experts, interested parties and/or the applicant that the proposed development shall:

1. Not result in undue water, air or noise pollution;
2. Have sufficient water available for its needs;
3. Not unreasonably burden the city's present or future water supply or distribution system; 4. Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;
4. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;
5. Not cause an unreasonable burden on the city's ability to provide educational services;
6. Not place an unreasonable burden on the city's ability to provide municipal services;
7. Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;
8. Not have an undue adverse effect on the city's present or future growth patterns nor on the city's fiscal ability to accommodate such growth, nor on the city's investment in public services and facilities;
9. Be in substantial conformance with the city's municipal development plan and all incorporated plans;
10. Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location; and/or
11. Not have an undue adverse impact on the present or projected park and recreation needs of the city.

5.5.1.5 Conditions of Approval:

In addition to imposing conditions of approval necessary to satisfy the General Standards specified in (a) or (b) above, the DRB may also impose additional conditions of approval relative to any of the following:

1. Mitigation measures, including but not limited to screening, landscaping, where necessary to reduce noise and glare and to maintain the property in a character in keeping with the surrounding area.
2. Time limits for construction.
3. Hours of operation and/or construction to reduce the impacts on surrounding properties. 4. That any future enlargement or alteration of the use return for review to the DRB to permit the specifying of new conditions; and,

4. Such additional reasonable performance standards, conditions and safeguards, as it may deem necessary to implement the purposes of this chapter and the zoning regulations.

5.5.1.6 Development Review Board Decisions, Findings of Fact:

In issuing a decision regarding an application for development subject to Conditional Use and/or Major Impact Review, the DRB shall issue Findings of Fact regarding the proposed application's satisfactory conformance with each of the review standards of Sec. 3.5.6, and may attach such additional reasonable conditions and safeguards as it may deem necessary to implement the purposes of this ordinance and the city's municipal development plan. Pursuant to the requirements of Sec. 3.2.8(e), the DRB shall act to approve or disapprove any such requested conditional use within forty-five (45) days after the date of close of the final public hearing held under this section, and failure to so act within such period shall be deemed approval. Any and all plans and documents pertaining to a request for Conditional Use and/or Major Impact Review as approved by the DRB along with the Findings of Fact issued, shall be incorporated into any permit issued, and except as otherwise provided, all development shall occur strictly in accordance with such approved plans, applications, findings, and conditions.

5.6 Stormwater & Erosion Prevention

Every zoning permit application involving major impact shall be accompanied by the following, as applicable:

1. A written approval from the department of public works for discharge to or connection with public sewers;
2. An "erosion prevention and sediment control (ESPC) plan";
3. A "stormwater management plan"; and
4. A written determination from the department of Public Works that the project for which a permit is requested complies with the City's MS4 general permit, CS discharge permit and the Vermont Stormwater Manual design requirements.

5.6.1 Standard Erosion Prevention & Sediment Control (EPSC) Plan

Ord. of 12-15-08(2), § 26-3-15

The erosion prevention and sediment control plan shall be prepared by or under the direction of a licensed professional engineer, a certified professional in erosion and sediment control (CPESC), or a certified inspector in erosion and sediment control (CIESC) and demonstrate conformance to the erosion and sediment control requirements and criteria contained in subsection (c) of this section. All erosion and sediment control devices must be installed and stabilized before the start of construction. The erosion prevention and sediment control plan shall contain both narrative and map(s).

5.6.2 Stormwater Management Plan

Ord. of 12-15-08(2), § 26-3-26

The stormwater management plan shall be prepared and signed by a licensed, professional engineer who shall verify and demonstrate conformance to the applicable water quality treatment standards and stormwater management design criteria contained in this division. The stormwater management plan shall contain both narrative and map(s).

5.7 Federal Heritage Documentation Programs

Heritage Documentation Programs administers the Historic American Buildings Survey (HABS), the Federal Government's oldest preservation program, and its companion programs: the Historic American Engineering Record (HAER) and Historic American Landscapes Survey (HALS). Documentation produced through the programs constitutes the nation's largest archive of historic architectural, engineering, and landscape documentation. The HABS/HAER/HALS Collection is housed at the Library of Congress.

The Historic American Buildings Survey (HABS) is the nation's first federal preservation program, begun in 1933 to document America's architectural heritage. Creation of the program was motivated primarily by the perceived need to mitigate the negative effects upon our history and culture of rapidly vanishing architectural resources. At the same time, important early preservation initiatives were just getting underway, such as restoration of the colonial capital at Williamsburg and the development within the National Park Service (NPS) of historical parks and National Historic Sites. Architects interested in the colonial era had previously produced drawings and photographs of historic architecture, but only on a limited, local, or regional basis. A source was needed to assist with the documentation of our architectural heritage, as well as with design and interpretation of historic resources, that was national in scope. As it was stated in the tripartite agreement between the American Institute of Architects, the Library of Congress, and the NPS that formed HABS, "A comprehensive and continuous national survey is the logical concern of the Federal Government." As a national survey, the HABS collection is intended to represent "a complete resume of the builder's art.

Thus, the building selection ranges in type and style from the monumental and architect-designed to the utilitarian and vernacular, including a sampling of our nation's vast array of regionally and ethnically derived building traditions.

5.7.1 HABS Guideline

HABS recording combines drawings, history, and photography to produce a comprehensive, interdisciplinary record. The documentation ranges in scope depending largely upon the level of significance and complexity. It should first and foremost convey what is most important about that particular structure. The drawings component generally includes floor plans, elevations, architectural details, and construction elements, sometimes expanded to include sectional or axonometric drawings to convey the interrelationship of the building parts. In the case of relatively simple vernacular structures, however, it may be enough to undertake only a first floor plan and significant architectural and structural details. The written history follows an outline

format that begins with a statement of significance supported by the development of the architectural and historical context in which the structure was built and subsequently evolved. The report also includes architectural description and bibliographic information. Again, in the case of a structure of limited complexity, the HABS short format historical report may suffice. The large-format, black-and-white photographs record the environmental setting, elevations, and significant details, both inside and out. The number of photographs should be weighed against the other components (and vice versa); it may be more appropriate to photograph rather than draw or describe elements such as secondary elevations and architectural details. In any case, each component of the documentation conveys an important piece; together they create a comprehensive understanding of the site.

5.7.2 Historic American Engineering Record (HAER)

The Historic American Engineering Record (HAER) was established in 1969 by the National Park Service, the American Society of Civil Engineers and the Library of Congress to document historic sites and structures related to engineering and industry. This agreement was later ratified by four other engineering societies: the American Society of Mechanical Engineers, the Institute of Electrical and Electronic Engineers, the American Institute of Chemical Engineers, and the American Institute of Mining, Metallurgical and Petroleum Engineers. Appropriate subjects for documentation are individual sites or objects, such as a bridge, ship, or steel works; or larger systems, like railroads, canals, electronic generation and transmission networks, parkways and roads.

HAER developed out of a close working alliance between the Historic American Buildings Survey (HABS) and the Smithsonian Institution's (SI) Museum of History and Technology (now the Museum of American History). From its inception, HAER focused less on the building fabric and more on the machinery and processes within, although structures of distinctly industrial character continue to be recorded. As the most ubiquitous historic engineering structure on the landscape, bridges have been a mainstay of HAER recording; HABS also documented more than 100 covered bridges prior to 1969. In recent years, maritime documentation has become an important program focus.

5.7.3 HAER Guidelines

As with HABS and HALS, HAER combines drawings, history, and photographs to produce a comprehensive, multidisciplinary record that ranges in scope with a site's level of significance and complexity. It should first and foremost convey what is most important about that particular structure. For HAER, the focus on structures and processes rather than buildings has shaped the elements of the documentation in distinct ways. The historical report employs a narrative format that has proven useful in tracing the evolution of engineering practices and their manifestation at a particular site. A drawing set can include an evolution of the site plan; typical plans, sections and elevations; exploded details; a subset of process drawings that depict the machinery and its placement as well as the flow of raw materials and product; and interpretive and axonometric drawings. Large-format, black-and-white photographs record the environmental setting (for bridges, this will include abutments; elevations; machinery and tool details, and significant details, both inside and out. The number of photographs will be determined by the site's

complexity and should be weighed against the other components (and visa versa); it may be more appropriate to photograph rather than draw or describe elements such as secondary elevations and architectural details. In any case, each component of the documentation conveys an important piece; together they create a comprehensive understanding of the site.

5.8 Public Trust – State Acts Defining Public Use

5.8.1 Section 2 of Act 53 reads as follows:

In addition to the uses previously authorized by the General Assembly for the filled land on the Burlington waterfront, including most recently Act No. 274 of the Acts of the 1989 Adjourned Session, the filled public trust lands located to the north of the centerline of Main Street within the City of Burlington may also be utilized, consistent with the standards embodied in Vermont's environmental laws and regulations, for the following public uses that benefit Vermont's public and are open to the public on an open and nondiscriminatory basis:

(1) governmental facilities such as: water and sewer plants; Coast Guard and naval facilities; roads that are accessory and transportation facilities that are accessory to the uses permitted under this section; or existing roads, and similar sized extensions of those roads, that service the filled public trust lands and immediately adjacent lands;
(2) indoor or outdoor parks and recreation uses and facilities including parks and open space, marinas open to the public on a nondiscriminatory basis, water dependent uses, boating and related services;
(3) the arts, educational and cultural activities including theatres and museums;
(4) fresh water and other environmental research activities;
(5) services related and accessory to the uses permitted under subdivisions (1),(2), (3) and (4) of this section, including restaurants, snack bars, and retail uses and ancillary parking. Only those uses that are subordinate and customarily incidental to the uses permitted under subdivision (1) through (4) of this section shall be considered as related and accessory services under this subdivision.

5.8.2 State Laws Affecting Public Use Definition on Public Trust Lands Not Including Moran (South Of Main St.)

NO. 87. AN ACT RELATING TO DESIGNATING ADDITIONAL ACTIVITIES AS PUBLIC USES ON THE FILLED PUBLIC TRUST LANDS ON THE BURLINGTON WATERFRONT AND EXTENDING THE GEOGRAPHIC AREA OF BURLINGTON UPON WHICH THESE ACTIVITIES MAY TAKE PLACE.

(H.788)

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. FINDINGS

The general assembly finds:

(1) that a need exists to modify the approved public uses of filled land on the portion of filled public trust lands located north of the centerline of Maple Street extending north to the centerline of Main Street within the City of Burlington;

(2) that the land involved in this legislation and the general assembly's historical relationship with that land are both unique;

(3) that the general assembly has authority to redesignate the public uses to which these filled public trust lands may be put; and

(4) that the development supported by the City of Burlington and authorized by this act is consistent with the public trust doctrine.

Sec. 2. AMENDMENT OF BOUNDARIES

The provisions of this act, as well as the provisions of Act No. 274 of the Acts of the 1989 Adjourned Session (1990) and Act No. 53 of the Acts of the 1991 Session shall be applicable to all filled lands on the Burlington waterfront lying north of the centerline of Maple Street as extended to the waters of the lake.

Sec. 3. ADDITIONAL AUTHORIZED USES FOR FILLED PUBLIC TRUST LANDS

In addition to the uses previously authorized by the general assembly in Act No. 274 of the Acts of the 1989 Adjourned Session (1990) and in Act No. 53 of the Acts of the 1991 Session, the filled public trust lands located north of the centerline of Maple Street extending north to the centerline of Main Street within the City of Burlington may also be utilized, consistent with the standards embodied in Vermont's environmental laws and regulations, for the following public uses that benefit Vermont's public and are available to the public on an open and nondiscriminatory basis:

(1) Facilities for transporting pedestrians and vehicles upon Lake Champlain by ferry and cruise vessels, including necessary docks, wharfs, maintenance facilities, administrative offices, gift shops, snack bars and related parking facilities.

(2) Marine related retail facilities.

(3) Restaurants.

Sec. 4. LIMITED EFFECT OF ACT

As was the case with Act No. 274 of the Acts of the 1989 Adjourned Session (1990) and in Act No. 53 of the Acts of the 1991 Session, because of the unique nature of these lands and the unique history of the legislature's involvement with these lands, this act is not intended to address the broader issues related to the public trust doctrine, but to leave open the opportunity for broad legislative discussion of more generalized public trust issues and action that may affect all public trust waters, lands and filled lands.

Sec. 5. REGULATORY REQUIREMENTS

The uses authorized by this act are subject to all applicable requirements of law.

Sec. 6. EFFECTIVE DATE

This act shall take effect upon passage.

Approved: April 1, 199

5.8.3 No. 22. an Act Relating to Approving Additional Public Uses for Public Trust Lands Located in Burlington Harbor

(H.326)

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. FINDINGS

The general assembly finds:

(1) that a need exists to modify the approved public uses of filled land on the portion of filled public trust lands located north of the centerline of Maple Street extending north to the centerline of Main Street within the City of Burlington;

(2) that the land involved in this legislation and the general assembly's historical relationship with that land are both unique;

(3) that the general assembly has authority to redesignate the public uses to which these filled public trust lands may be put; and

(4) that the development supported by the City of Burlington and previously authorized or authorized by Sec. 2 of this act, consisting of the relocation of the bicycle path closer to Lake Champlain, the development of a shoreline promenade, the elimination of a number of blighted buildings, and the creation of an inn, market, and related public facilities, is consistent with the public trust doctrine.

Sec. 2. ADDITIONAL AUTHORIZED USES FOR FILLED PUBLIC TRUST LANDS

(a) In addition to the uses previously authorized by the general assembly in Act No. 274 of the Acts of the 1989 Adjourned Session (1990), Act No. 53 of the Acts of the 1991 Session and Act No. 87 of the Acts of the 1995 Adjourned Session (1996), the filled public trust lands located north of the centerline of Maple Street extending north to the centerline of Main Street within the City of Burlington may also be utilized, consistent with the standards embodied in Vermont's environmental laws and regulations, for the following public uses that benefit Vermont's public and are available to the public on an open and nondiscriminatory basis:

(1) Inns with public space, including restaurant, restroom and retail use. Restrooms in the inns shall be available to the public.

(2) Public markets.

(b) The authorization granted under subdivision (a)(1) of this section is contingent upon the prior and continuing availability in Burlington Harbor of 45 transient dock slips which are appropriately marked for convenient access.

(c) The authorization granted under subdivision (a)(1) of this section is contingent upon the availability, in perpetuity, of uninterrupted public access along the shoreline of Lake Champlain from the centerline of Maple Street extending north to the centerline of Main Street within the City of Burlington.

(d) The terms of this act shall be recited in an easement deed from the owner of the privately owned filled land to the State of Vermont and said easement deed shall be recorded in the land records of the City of Burlington.

Sec. 3. LIMITED EFFECT OF ACT

As was the case with Act No. 274 of the Acts of the 1989 Adjourned Session (1990), Act No. 53 of the Acts of the 1991 Session and Act No. 87 of the Acts of the 1995 Adjourned Session (1996), because of the unique nature of these lands and the unique history of the legislature's involvement with these lands, this act is not intended to address the broader issues related to the public trust doctrine, but to leave open the opportunity for broad legislative discussion of more generalized public trust issues and action that may affect all public trust waters, lands and filled lands.

Sec. 4. REGULATORY REQUIREMENTS

The uses authorized by this act are subject to all applicable requirements of law.

Sec. 5. EFFECTIVE DATE

This act shall take effect upon passage.

Approved: May 8, 1997

5.9 Environmental Literature Review and Summary of Environmental Considerations

January 19, 2017

Kirsten Merriman Shapiro
Senior Policy and Project Specialist
Community & Economic Development Office
City Hall, 149 Church Street
Burlington, VT 05401

Re: Moran Building Literature Review and Summary of Environmental Considerations
Burlington, Vermont

Dear Kirsten:

The Johnson Company (JCO) is pleased to present the City of Burlington (the City) with the following report summarizing our document review of the environmental status of the Moran building structure. This report has been prepared in response to a request from Burlington's Community & Economic Development Office (CEDO) and is intended to provide the basis to better understand the environmental concerns associated with the building. JCO understands that rehabilitation of the Moran structure may not be feasible, and therefore the City would like to evaluate various demolition scenarios for the Moran building in order to better understand the environmental challenges that could significantly influence the cost and timeline of each demolition scenario. JCO also understands that the City will be seeking to develop cost estimates for the different demolition scenarios; however, estimating these costs is not part of the scope of this report. The information provided in this document is based on a review of the following reports, with an emphasis placed on more recent documents (i.e. the August 24, 2011 Waite Environmental Management Corrective Action Plan):

- Waite Environmental Management, LLC, *Groundwater Monitoring Report & Interim Corrective Action Plan, Moran Generating Plant*, March 13, 2007, revised May 7, 2007.
- Waite Environmental Management, LLC, *Corrective Action Plan for Building Cleanup, Moran Plant*, March 11, 2009, revised March 17, 2009.
- Lincoln Applied Geology, Inc., *Moran Plant Rehabilitation*, October 22, 2009.
- The Johnson Company, *Remediation Report, Moran Plant Project*, January 10, 2011.
- Letter from Waite Environmental Management, LLC to VT DEC, re: Sediment and Water Sampling Results, December 22, 2010.
- Waite Environmental Management, LLC and The Johnson Company, *Report on Supplemental PCB Sampling of Basement Concrete Floor, Moran Generating Plant*, February 16, 2011; revised, March 16, 2011.

- Waite Environmental Management, LLC, *Transformer Yard Subsurface Investigation Report, Moran Generating Plant,* February 17, 2011; revised March 17, 2011.

- Waite Environmental Management, LLC, *Corrective Action for Moran Center and Waterfront Access North, 475 Lake Street,* August 24, 2011.

SUMMARY OF ASSESSMENT, REMEDIATION, AND CORRECTIVE ACTION PLANNING ACTIVITIES

The following provides a summary of the more significant events related to the environmental history of the Moran building. Note that the events summarized below are relevant only to the interior of the building – exterior investigations, corrective actions, remediation were conducted outside the building during this timeframe which are not summarized as they have limited relevance to the scope of this effort.

Date	Event
1951	The land for the Moran plant was purchased from the Central Vermont Railway, and ground was broken on the plant in 1952. The plant began producing power in 1954.
1987	The Moran plant was decommissioned. As part of this effort, initial asbestos-containing material (ACM) abatement was conducted. The air clearance testing conducted in conjunction with the ACM abatement found a "definite ACM hazard to personnel" from dust in the building
2008-2009	The sluice gate, which formerly connected the building basement to Lake Champlain, was permanently sealed with subaqueous grout in response to concerns that potential contaminants in the building basement may be migrating into the lake.
2008	In 2008, samples of water (from the Moran basement and Lake Champlain) and sediment (basement only) were collected in anticipation of dewatering the basement. The results are summarized as follows: • The lake water sample reported barium, chromium, and lead at concentrations above laboratory reporting limits. Analysis for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) did not report detectable concentrations. • The interior water samples reported detections of VOCs, one PCB Aroclor (PCB-1254), PAHs, and metals (including "very high" concentrations of arsenic and lead. • The interior sediment samples reported detections of chlorinated VOCs, two PCB Aroclors (the highest concentration was PCB-1254 at 1.1 mg/kg), PAHs, and metals. The concentrations of lead, arsenic, chromium, and mercury present in the sediment required that the sediment be handled as RCRA hazardous waste.
2009	A cleanup of the building interior was conducted. This cleanup consisted of: • Pumping, filtering, settling, and disposal of 342,150 gallons of water from the basement level • Removal of 4 tons of bird guano from the building interior • Removal of 475 tons of debris and scrap metal • Removal of 8 cubic yards of lead paint waste • Removal of 800 ft^2 of asbestos-containing window caulk

Date	Event
	• Removal of 600 ft^2 of asbestos-containing hard board Following this cleanup, additional asbestos testing was conducted, which found five new ACM materials (tar paper, "mudded joint fitting", gasket rope, gasket material, and caulking). This assessment also found that debris from broken transite panels had fallen into the basement floor. However, the dust samples collected were all reported to be negative for asbestos.
2010	A second interior clean-up was conducted. This removal action removed the interior water and the basement sediment sampled during the 2008 sampling event. The removal action consisted of: • Removal of approximately 1,000 to 1,500 pounds of loose ACM debris (mixed with sediment) from the basement • Removal of 60 cubic yards of sediment (disposed as RCRA hazardous waste) from the basement floor, generator pits, and ash trenches. The floor was subsequently pressure washed and vacuumed clean • Pumping, filtering, settling, and disposal of approximately 30,000-gallons of water from the basement
2010	During the 2010 cleanup described above, two sub-floor channels underneath the basement were discovered. A layer of sediment was found to be present in these channels. Samples of water and sediment were collected from each of these channels. The results are summarized as follows: • Water in the channels did not contain detectable concentrations of VOCs or PCBs. Detections of PAHs, and metals were reported in one or both of the channels; based on the detected concentrations the water in the channels is not suitable for discharge to the lake • Sediment in the channel was found to be contaminated with one VOC (1,1-DCA), PAHs, PCBs, and metals. The sediment would be classified as RCRA hazardous based on the metals concentrations. In addition, it should be noted that total PCB concentrations ranged from 1.6 mg/kg to 6.3 mg/kg, which are above the Toxic Substances Control Act (TSCA) threshold of 1 mg/kg. • During this work, it was found that pipes were present which connected the southern channel to the generator pits, but the dimensions of the channels, potential interconnectivity, and the possibility for connections to the building exterior were not determined.
2010	In December 2010, samples of lake water and sediment were collected from the dock immediately west of the plant. This sampling found that: • The lake water had no detections of VOCs, PAHs, or PCBs. The only compounds detected were barium and lead, which were detected at concentrations below Vermont drinking water standards • While no VOCs were detected in the sediment sample, PAHs, arsenic, and PCBs were found in excess of sediment quality standards. It should be noted that one of the two PCB Aroclors detected in the sediment sample (Aroclor-1242) was not detected anywhere else in the interior of the building or around the immediate exterior of the building, and therefore may be indicative of another source.

Date	Event
2010-2011	Between December 2010 and January 2011, bulk concrete samples were collected from the basement level for PCB analysis. One oil sample was also collected. The results are summarized as follows: • No PCBs were detected in the oil sample • Ten (10) of the 32 concrete samples contained PCBs at concentrations above the 1 mg/kg TSCA high occupancy threshold. The two most elevated concentrations (15 mg/kg and 6.5 mg/kg) were associated with an area which may have formerly contained an electrical panel.

EXTERIOR ASSESSMENT AND REMEDIATION

Between 2006 and 2016 numerous soil and groundwater investigations took place around the grounds of the Moran Plant and between 2013 and 2016 construction on the Waterfront Access North (WAN) project occurred. Because the bulk of the information collected during these investigations and during the WAN construction is not relevant to the building demolition, these activities are not summarized individually. However certain information, summarized below, may be relevant if demolition of the building below ground surface is undertaken:

- Groundwater levels vary seasonally, but are generally less than 5 feet below ground surface
- The typical soils below the water table are "flowing sands", meaning that the flow of water into an excavation made below the water table destabilizes the sand and causes the walls of the excavation to become unstable and collapse.
- The groundwater in the vicinity of the Moran plant, particularly north of the building, may be impacted with chlorinated and/or petroleum VOCs. However, it should be noted that VTDEC is requiring no additional groundwater investigation and authorized the decommissioning of monitoring wells in 2013. If deeper demolition requiring dewatering is undertaken, then the dewatering effluent may need to be treated before discharge.
- The upper strata of soil in the vicinity of the Moran plant are impacted with PAHs, arsenic, and possibly petroleum VOCs. Any soils disturbed during demolition which cannot be re-used onsite will need to be transported off-site for disposal at an approved receiving facility. Based on the results of the WAN project, the soil is likely suitable for disposal as "alternative daily cover"
- No soil or groundwater quality data exists for the zone immediately below the building.

PCB remediation occurred in the former transformer switch yard in an area immediately to the southeast of the building. Although the majority of PCB impacted concrete and soil was removed, some inaccessible concrete remains buried in place at depth.

SUMMARY OF REMAINING ENVIRONMENTAL CONDITIONS

Based on our review of available documents, JCO has identified the following environmental conditions which may affect demolition costs and schedule. Additionally, JCO understands that the City would like to explore four demolition scenarios which include:

- Scenario 1: Removal of all building materials above an elevation of 103 feet above sea level (fasl, current ground surface);
- Scenario 2: Removal of all building materials above an elevation of 101 fsal (2-feet below current ground surface)

- Scenario 3: Removal of all building materials above an elevation of 96 fsal (assumed current elevation of lower basement floor)
- Scenario 4: Removal of all building materials including all concrete footers, foundations, and subsurface structures, regardless of depth

It should be noted that all environmental conditions do not apply to each of the four demolition scenarios.

Soil Contamination Surrounding the Building

The soils around the Moran plant are known to be contaminated with metals and PAHs, as well as isolated pockets of VOCs (primarily petroleum related) were encountered during construction of the WAN project.

Groundwater Contamination Surrounding the Building

Chlorinated solvents and petroleum constituents were detected in groundwater near the building. If dewatering is required, the water will likely need to be treated prior to discharge. Historically the Burlington Wastewater Treatment Plant has accepted and treated this water; however, at very limiting discharge rate.

Contaminated Water and Sediment in the Sub-Floor Channels

The water and sediment in the sub-floor channels are contaminated with metals and PAHs and sediment in the channels is also contaminated with VOCs and PCBs. Based on the aqueous concentrations, the water in the channels is not suitable for direct discharge to the lake. Based on the concentrations detected in sediment, if the sediment cannot remain in place through sequestration of the contaminants, the material will likely require disposal as RCRA hazardous waste. In addition, it is unclear if these channels are connected to the building exterior in any way.

PCBs in Concrete

PCBs were detected in concrete in the basement floor at concentrations of up to 15 mg/kg, which is above the TSCA regulatory threshold of 1 mg/kg (assuming a high-occupancy reuse scenario). PCB sampling efforts were focused in the basement because this was considered to be the area most likely to have staged PCB-containing equipment (transformers, etc.) and therefore the area most likely to have been contaminated with PCBs. To date no PCB assessment of the upper levels of the building has been conducted; however a waste disposal receiving facility may request representative concrete samples of the upper portion of the building to confirm PCB concentrations are consistently below their threshold for waste acceptance. It should be noted that surfaces may have been coated with PCB containing paint.

Bird Waste

In 2009, four tons of bird guano was removed from the building. This material was collected over the intervening 22 years between 1987 (when the plant was decommissioned) and 2009. Eight years have elapsed since the bird guano was removed; it is considered likely that a significant quantity of

additional guano has been deposited. It is unlikely that the guano would influence demolition, but its presence should be considered for worker safety.

PCB-Containing Building Materials

Based on the age and construction of the building, it is possible that PCB-containing building materials (caulk, paint, sealant, window glaze, roofing materials, etc.) may be present. No record of a PCB building materials inspection was found during the document review; the assessments conducted to date in the building have focused on lead-paint and asbestos. While PCB-containing building materials are often co-located with ACM, this is not always the case.

Asbestos-containing materials

While some asbestos abatement has been conducted, as of 2009 it was known that at least five new ACM materials (tar paper, "mudded joint fitting", gasket rope, gasket material, and caulking) remain. Prior to demolition a licensed asbestos abatement designer must confirm that the building is free of ACM. That being said, a comprehensive asbestos assessment of the entire structure will likely need to be conducted in order for the designer 'clear' the building. The most likely areas where additional ACM may be present are upper areas of the building (i.e. the source of the fallen transite removed in 2010 from the basement), the five ACM materials listed above, the basement (if additional transite paneling has fallen from upper floors), and the roofing materials. The presence of asbestos in concrete and mortar should also be verified.

Lead-based Paint

Substantial removal efforts have been conducted to remove loose lead-based paint. Typically, a toxicity characteristic leaching procedure (TCLP) analysis for lead will be required by the construction and demolition (C&D) waste receiving facility to confirm the waste stream does not exceed hazardous levels for lead. However, it is rare that a waste stream such as this would exceed hazardous levels for lead.

SUMMARY OF ADDITIONAL ACTIVITIES WHICH MAY BE REQUIRED

The following sections discuss the assessments, remedial actions, abatements, regulatory correspondence/negotiations which should be considered prior to or as a result of demolition.

ASSESSMENTS AND INVESTIGATIONS

Sub-Basement Channel Connectivity Investigation

Since the degree of connectivity between the subsurface channels, the building basement, groundwater, and the Lake is unknown, the approved 2011 Waite Environmental Management Corrective Action Plan (CAP) suggests a follow-up exploratory effort be performed to identify any conduits or perforations. Possible investigation alternatives include a submersible camera and dewatering/visual inspection. However, the water in these channels may have relatively high turbidity and therefore an exploratory camera effort may not be sufficient to conclusively assess the potential for hydraulic conductivity. If the results of this effort indicate a direct hydraulic connection to the outside, then sediment removal or channel filling/sealing may be required.

Although the 2011 CAP suggested this was to occur in summer/fall of 2011 and a CAP Addendum would be drafted based on the results, it does not appear that this actually occurred. The actual investigation design will depend to some degree on how the sediment in the channels is to be managed.

This topic should be discussed with VTDEC in the context of practicality to evaluate if sequestration of the contaminants in place by simply filling the channels with a structurally competent/low hydraulic conductivity material will satisfy their concerns.

Additional PCB Concrete Sampling

Depending on the selected demolition scenario and the requirements of the receiving facility and/or the VTDEC and TSCA, additional concrete sampling may be required prior to demolition to further assess the extent of PCB contamination in concrete. The 2011 CAP suggests that TSCA will not have jurisdiction of this clean-up effort and therefore the selected remedy would only need to satisfy VTDEC's requirements. However, JCO understands that a formal memorandum from TSCA stating this was not generated. This topic should be discussed with VTDEC and TSCA to confirm they are the sole party with jurisdiction over the remedial effort. This assumes that no additional or new data suggests a more wide spread PCB concern of greater magnitude than what is currently understood to exist. It should be noted that the approved CAP suggested no additional PCB sampling, but also assumed that the existing structure would remain in place and be isolated under an engineered barrier and filled. However, it should be noted that as the date of this report the presence or absence of PCBs on painted surfaces has not been confirmed. Should Scenario 4 be pursued, the extent of deeper PCB impacts (below the basement slab) is unknown and the likelihood of more elevated PCB impacts exists.

Soil Disposal Pre-Characterization

If the demolition option chosen is likely to result in the excavation of soils which are not suitable for reuse on-site (most likely from a structural standpoint), then it would be prudent to collect pre-characterization samples and to obtain disposal approval to avoid costly delays and eliminate the need to temporarily stockpile soils. The need for soil disposal is most likely to occur if all building materials are removed to the basement level or lower.

Asbestos Inspection

Because the exact locations and quantities of remaining ACM in the building are not entirely understood an asbestos inspection will be required to obtain the necessary information to design a comprehensive abatement work plan and obtain a demolition permit.

Bird Waste Inspection

The degree of re-contamination of the building with bird waste should be evaluated in the context of demolition and worker safety.

Waste Stream Sampling

The receiving facility will require analytical sampling to characterize the construction debris for disposal. This analytical will be used to determine an appropriate receiving facility.

Lead Paint Inspection

The presence of lead-based paint in the building will need to be evaluated for the facility receiving the demolition waste. The degree of further lead paint inspection will need to be discussed with the proposed receiving facility, the Department of Health, and the City of Burlington. It is anticipated that the only requirement will be to provide TCLP lead analyses that are representative of the waste stream to satisfy the receiving facilities requirements. However, if the painted concrete is to be recycled a more through lead-paint inspection will be required.

PCB Building Inspection

The possible presence of PCB building materials in the building may or may not be a concern for the facility receiving the demolition waste. This is dependent of the PCB concentrations in said material. Should concentrations exceed 50 part per million (ppm), the material would be considered hazardous and should be removed and disposed of appropriately before demolition. Concentrations below 50 ppm are likely to be acceptable for incorporation as C&D waste and disposed of in an appropriately certified lined landfill. Additionally, if concrete is proposed for recycling and not landfill disposal a more rigorous PCB inspection of concrete will be required, particularly on painted surfaces. The need for further inspection should be discussed with the receiving facility, the VTDEC, and the City of Burlington.

Historic Preservation Documentation

The Moran generating station was listed on the National Registry of Historic Places on December 17, 2010. As a condition of approval for demolition, the historic preservation authorities will likely require that the condition of the plant be memorialized for posterity. JCO assumes the City will collaborate with the State Historic Preservation Office (SHPO) to obtain the necessary clearance.

REMEDIAL ACTIONS AND ABATEMENTS

Removal of Sediment from the Sub-Basement Channels

If the entire building and sub-grade features (footers, foundations, etc.) are to be demolished, the contaminated sediment in the sub-channels will need to be removed and disposed of prior to demolition. The disposition of the sub-basement channels and appropriate management should be discussed with the VTDEC in the context of demolition.

Sequestration of Sediment in Sub-Basement Channels

If connections between the sub-basement channels and the building exterior are expected, but the selected demolition plan does not call for the sub-basement channels to be removed, in place sequestration of the sediment in place is likely to be the preferred option. This would be achieved by introducing a structurally competent low-permeability flowable fill material into the sub-channels. This approach will serve two purposes: 1) the potential communication with groundwater and the impacted sediment should be significantly reduced; and 2) the current voids in the subsurface will be filled for the purpose of structural competency. Prior to initiating this remedial approach, approval should be obtained from VTDEC.

Asbestos Abatement

Demolition of the building cannot cost effectively occur while ACM is or may be present in the building. Therefore abatement will be required to remove any ACM identified during the inspection, prior to demolition.

Vapor Intrusion Mitigation

If a new building is to be constructed using the existing foundation, installation of vapor intrusion mitigation system would be required as per the 2011 CAP, due to the presence of chlorinated solvents in groundwater near the building, petroleum products in soil and groundwater near the building, and the presence of PCBs in concrete in the basement level (assuming the basement floor is not removed, i.e. Scenario 4 is not selected). Following installation of the system, indoor air clearance testing would be required, to confirm the system's effectiveness.

Institutional Control

Unless all contaminated materials are removed, an Institutional Control (either a Notice to the Land Records or a deed restriction) must be prepared and filed in the Burlington land records. It should be noted that upon completion of the WAN project an institution control will be drafted to document the residual and known contamination that remains in exterior portions of the property. It is anticipated that this institution control will simply be updated to incorporate any residual contamination that remains within the building structure after demolition. The purpose of the Institutional Control is to protect human health by informing future users of the property of the presence, location, and degree of residual contamination as well as document future operation and maintenance requirements to ensure the corrective action measures continue to function as designed. In addition, this document will restrict future use of the property (i.e. no residential reuse).

Additional Bird Waste Removal

Depending on the quantity of bird waste deposited in the past eight years, removal of the waste may be required prior to demolition to protect worker safety.

Lead Paint Abatement

Depending on the results of the TCLP testing for lead and the requirements of the receiving facility, abatement may be required prior to demolition, although this is unlikely.

PCB Building Materials Abatement

PCB building materials can be included in the demolition waste stream (assuming it is destined for an appropriately certified landfill), provided analytical testing of the materials that are likely to contain PCBs (paint, window glaze, caulk, sealant, etc.) do not exceed 50 ppm. However, PCB abatement will be required for any materials that exceed this threshold prior to demolition. Furthermore, if the concrete and other building materials are proposed for recycling (not disposal as C&D) a more rigorous PCB inspection will likely be required to confirm the material is free of PCBs.

Soil Disposal

The deeper the disturbance required to complete the demolition, the greater the likelihood that soils will be excavated that cannot be re-used on site. This is particularly of concern for Scenario 4, because the soil quality beneath the basement slab is unknown.

Dewatering and Treatment

The deeper the disturbance required to complete the demolition, the greater the likelihood that groundwater will be encountered. Based on our experience at the WAN redevelopment project, excavation beneath the water table without dewatering is unlikely to be feasible. Therefore, if the building is to be removed to an elevation below the water table, then dewatering will be required. Due to the known contaminants in groundwater (particularly VOCs), this water is expected to require treatment before it can be discharged and the anticipated flow rate generated is expected to exceed the capacity of Burlington's Wastewater Treatment Plant. Therefore, a mobile treatment system will likely need to be employed, which increases the cost.

On-site Soil Stockpiling and Management

The volume of soil disturbed will increase quickly as the depth of excavation increased due to the need to bench the excavation for safety purposes. Alternatively sheet-piling could be driven to shore up excavation side walls. It is possible that, for the shallower excavations, the excavated soils can be backfilled directly into the basement. However, for removal of all building materials (Scenario 4) regardless of depth it is considered likely that soil stockpiling would be required. These soils would need to be managed and continuously maintained to prevent migration to Lake Champlain (i.e. poly encapsulation and installation of sediment fence).

STAKEHOLDER DISCUSSIONS

Sub-Basement Channels

Discussions with the VTDEC regarding the contaminated materials in the sub-basement channels and the potential for connectivity between the channels and the building exterior (groundwater and/or Lake Champlain) must be conducted. These discussions should resolve the following questions:

- What degree of investigation is required (if any) to assess the degree of connectivity between the channels and the building exterior?
- Can the sediment remain in place given the currently-known concentrations of contaminants in the sediment? Would further analytical sampling be required before this determination of sediment management can be made? If sediment was to remain in place, would filling the channels with a flowable, low permeability material satisfy VTDEC concerns?

TSCA Regulatory Involvement

Although the 2011 CAP suggests TSCA would not have jurisdiction over the management of PCB impacted materials at the Site, this should be confirmed and appropriately documented in a CAP Addendum.

State Historic Preservation Office and/or EPA Section 106

The Moran Plant is listed on the National Register of Historic Places and therefore cannot be demolished without approval from state and/or federal historic preservation authorities. Again, JCO assumes the City has or will address this concern.

Lead Paint and PCB Building Materials Inspections

The degree of lead paint and/or PCB building materials inspections should be discussed with the proposed C&D receiving facility. If building materials are proposed for recycling a more rigorous lead-paint and PCB inspection of this materials will be required.

Waste Stream Sampling

The analytical requirements for the waste stream sampling should be discussed with the receiving facility.

REQUIRED DOCUMENTS

Corrective Action Plan Addendum

An addendum to the 2011 CAP will be required, because building demolition was not considered as an alternative in the 2011 CAP. The degree of modification required to the CAP will be dependent on the selected demolition scenario. It is anticipated that greater the depth of demolition; the more modification to the current 2011 will be required.

Additional Assessment Reports

Additional assessment reports will need to be prepared and submitted to the VTDEC for review. It is anticipated that this reporting will be limited to those analyses required to address the sediment in the sub-channels (as needed), any additional PCB, ACM, and lead-paint analyses required, and all pre-demolition waste stream analyses. It is possible that these assessment reports could be incorporated into the CAP Addendum.

Waste Stream Disposal Profiles

Disposal profiles for the waste stream(s) will need to be prepared and submitted to the receiving facility for review and approval.

COMPARISON OF CORRECTIVE ACTIONS SPECIFIC TO DEMOLITION SCENARIOS

JCO understands that the specific redevelopment use of the Moran Building footprint following demolition has not been determined. However, two broad categories of reuse are likely, should demolition be pursued. The first is that a new building is constructed on the footprint of the existing building. The second is that the footprint of the current building is filled and used as a park or green space. Where applicable, these two re-use scenarios will be considered when discussing the required actions at the Moran Plant. The following presents an overview of the corrective actions that should be considered for each proposed demolition scenario.

SCENARIO 1: REMOVAL OF ALL BUILDING MATERIALS ABOVE 103 FASL (current ground surface)

This option involves demolition of the building superstructure to the current ground surface. The basement would then be backfilled with appropriate fill consistent with the redevelopment goals. If the redevelopment is construction of a replacement building, then the basement will need to be backfilled with structural fill and a vapor intrusion mitigation system will need to be installed. Additionally, the sediment in the subchannels will need to be addressed in manner that is to be determined pending further discussion with VTDEC.

SCENARIO 2: REMOVAL OF ALL BUILDING MATERIALS ABOVE 101 FASL (2-ft below current ground surface)

This option involves demolition of the building superstructure to two feet below current ground surface. As with Scenario 1 above, the basement would then be backfilled with appropriate fill consistent with the redevelopment goals. If the redevelopment is construction of a replacement building, then the basement will need to be backfilled with structural fill and a vapor intrusion mitigation system will need to be installed. This demolition scenario will be more expensive than Scenario 1, because additional building materials will require removal and disposal. It is considered unlikely that the degree of disturbance required to remove the building to 2-feet below ground surface will result in the need for soil disposal or dewatering and treatment.

SCENARIO 3: REMOVAL OF ALL BUILDING MATERIALS ABOVE 96 FASL (Assumed Basement Floor Elevation)

This option involves demolition of the building to the level of the basement floor (approximately 96 fasl. At that point, walls and a structural slab could be poured for a new building or the excavation could be backfilled. The advantage of this option is that the remaining large concrete objects would be at depth and would be less likely to interfere with redevelopment, should a new building with new foundation be approved in the footprint of the former building. The down-side of this option is that given the water table elevation above the basement floor and the sandy nature of the soils around the Moran Plant, it is likely that dewatering and treatment would be required to complete the excavation. In addition, the deeper concrete removal effort of building foundation walls would result in a much greater volume of concrete requiring disposal and excavated soil. Furthermore, there is a greater likelihood that soils would be encountered that are unsuitable for re-use from a structural and/or environmental perspective, therefore requiring off-site disposal. Soil stockpiling and management may also be required depending on the sequencing of demolition.

SCENARIO 4: REMOVAL OF ALL BUILDING MATERIALS REGARDLESS OF DEPTH

This option involves demolition and removal of all building materials associated with the Moran building, including the basement floor and any footers or foundation blocks. This option gives the most flexibility in terms of redevelopment, as no sub-surface impediments will remain. However, this option will require a significant dewatering effort given that the work will be taking place 10-feet or more below the water table and off-site soil disposal is more likely to be required due to the extensive soil disturbance required. Sediment must be removed from the sub-basement channels and appropriately disposed of at an appropriately certified facility. In addition, soil would likely need to be stockpiled and managed on-site during the demolition. Lastly, there are significant uncertainties associated with this scenario which include:

4. Soil or groundwater quality assessments beneath the building have not been conducted and although unlikely a wide variety of contamination affecting various media could potentially exist beneath the slab, having significant cost and schedule implications;
5. Considering PCBs were found in the basement concrete floor at concentrations of up to 15 ppm, although unlikely, the potential exists for more extensive PCB impacts below the building. If PCB concentrations where identified that exceed the 50 ppm hazardous threshold significant cost and schedule implications would be expected; and
6. Considering the depth of excavation required and the assumed thickness of the basement

OVERVIEW OF ENVIRONMENTAL CONCERNS AND NECESSARY ACTIONS

A summary of the additional assessment and remedial action requirements, suggested stakeholder discussion and potential reporting requirements that should be considered when comparing the four demolition scenarios is presented in Table 1, attached.

Thank you for the opportunity to prepare this summary report in support of this project. Should you have any questions or comments, please do not hesitate to contact us at (802) 229-4600.

Sincerely,
THE JOHNSON COMPANY, INC.
Kurt Muller, P.E.
Senior Project Engineer/Manager

5.10 Detailed Demolition Narratives & Estimates

5.10.1 Casella Narrative

Mass Demolition Scope of work:
Demolition of the Moran building is a sophisticated project inclusive of many disciplines and phases of work. The purpose of this narrative is to explain to the readers how Casella Construction, Inc. (CCI) would proceed with the demolition of the building and explain the assumptions we made in our preliminary estimate.
The building was constructed in the 1950's and is comprised of a cast in place concrete foundation extending 20-feet below grade in some locations. The foundation has a slab on grade which serves as the basement floor as well as two subbasement levels which are only accessible through manholes. The first subbasement level, elevation 91-feet, contains as many as five pipe channels which contain various pipe networks we believe conveyed water from the intake channels (below) to the generators pits on the north end of the building. The second subbasement level, elevation 86-feet, contains two channels which brought water from Lake Champlain into the building for distribution to the generators and two channels which returned water to the Lake. The building bares on a substantial cast in place concrete mud-mat, which serves as the floor for the pipe channels and circulation channels. This concrete mud-mat is 5-feet thick in some locations.
The structure of the building is constructed from structural steel frame, concrete masonry units (CMU) curtain wall, brick veneer, cast in place concrete floors at levels one and two, and steel grating floors at levels 3 through 7. We assume the roof is comprised of a metal roof deck built-up with rigid insulation and roof membrane.
The demolition sequence outlined below will begin after all the asbestos abatement is complete and hazardous materials not associated with the building structure are removed. This includes the complete removal of the rigid insulation and roof membrane above the metal roof-deck.

Site Preparation:
Demolition will begin by securing the site and protecting the construction site and adjacent pedestrians from demolition activities. Signage will be installed to make pedestrian and vehicular traffic aware of proposed traffic patterns and demolition activities. CCI proposes to install an 8-foot chain link fence wind screen at the perimeter of the project area. The fence will include one primary point of vehicular access helping to control traffic. A gate guard will be stationed at the gate during demolition activities to help manage construction vehicles

Erosion Control
Erosion controls will be installed to prevent the migration of disturbed soil during the project. This may include installation of silt fence, inlet protection around any drain inlets, stabilized construction entrance, and the temporary stabilization of any stockpiled soil. These measures will be maintained for the duration of the project.

Interior Demolition
Building demolition will begin by removing as many dissimilar materials from the building as possible. This includes removal of drywall, suspended ceilings, wood framing, bathroom

fixtures, and any other construction and demolition material (C&D). These materials will be removed using hand tools, scissor lifts, and will be disposed of in dumpsters and transported to a C&D recycling facility.

Building Demolition
Building demolition includes the removal of the building and foundation. This work will be performed using a number of hydraulic excavators with various attachments capable of shearing steel, pulverizing concrete, and sorting C&D.

Proposed Equipment List:

1. **Dust Boss DB 60**

2. **High Reach Excavator with Shear and Concrete Pulverizer**

3. **Cat 330 Excavator with Cat MP 30 Shear and Concrete Pulverizer**

4. **Cat 320 Excavator with Mechanical Concrete Pulverizer (Owned)**

5. **Cat 330 Excavator with Hydraulic Thumb**

6. **Cat 345 Excavator**

7. John Deere 350 Excavator with Hydraulic Hammer

CCI will use the high reach excavator to first remove the brick and CMU curtain wall. The wall section will be removed from the top down. Any material resting on the concrete slabs will be pulled off and collected at the base of the exterior of the building.
Preliminary investigations showed that almost all interior masonry surfaces including CMU, concrete slabs, and foundation walls were painted with a marine grade paint containing non-hazardous levels of PCB's. Thus, all painted masonry materials will need to be transported offsite and disposed of at a certified landfill capable of accepting these materials. Masonry materials will be transported using either dump trucks or steel dump trailers.
Dust mitigation is an important component to any project but this project specifically. CCI expects to utilize various levels of dust control to manage dust on this project.

1. The high reach excavator is outfitted with a dust suppression system that allows the machine and operator to continuously spray water at the machines tool or implements. This is the location where dust will be created.
2. A man-lift and hose and nozzle will be used to spray additional water on material being removed at any elevation.
3. Various hoses and nozzles will be used at ground level to control dust as debris hits the ground.
4. A dust suppression system will be used to spray a mist over the entire site.

The building's steel frame will be deconstructed from the top down and steel processed to lengths 5-feet and less. The steel is painted with the same paint containing PCB's and must be processed and hauled to the landfill for disposal. This estimate assumes that all steel needs to be hauled offsite for disposal. The reinforced concrete slabs and levels 1 and 2 will be pulverized and separated from the steel structure to facilitate the demolition.

Foundation Demolition

The demolition of the concrete foundation will vary depending on the scenario chosen. The foundation will be left intact in scenario one, partially removed in scenario two and three, and completely removed in scenery four. All concrete and steel removed in scenarios two through four is assumed to contain PCB's per the results of limited sampling and will be transported offsite for disposal.

Scenario one:
The building, first floor, interior walls, stairs, and elevated slabs will be removed. This cast in place concrete foundation walls, basement slab, and all sub-basement concrete will remain.

Scenario two:
The building, first floor, interior walls, stairs, and elevated slabs will be removed. The foundation walls will be removed to elevation 103 feet, the approximate elevation of existing grade. The foundation will be saw cut at that elevation to facilitate a future use as proposed.

Scenario three:
The building, first floor, interior walls, stairs, and elevated slabs will be removed. The foundation walls will be removed to elevation 96 feet, the elevation of the basement slab. Soil will be excavated at a 2:1 slope behind the concrete wall and stockpiled onsite. This is necessary to stabilize the soil as the foundation is removed.
In this scenario, the exterior concrete flume or channel will be left intact as will the portion of the concrete wall separating the building from Lake Champlain. This will give the project a natural barrier from the Lake.

Scenario four:
The building, first floor, interior walls, stairs, and elevated slabs will be removed. The foundation walls will be removed in its entirely to elevation 83.5 feet. Steel sheet piling will be installed around the perimeter of the building prior to removing the foundation. This will cut-off groundwater and support the adjacent soil. It is very likely that ground water will need to be pumped from this excavation where it will be treated as required.
In this scenario, the exterior concrete flume or channel will be left intact as will the portion of the concrete wall separating the building from Lake Champlain. This will give the project a natural barrier from the Lake.

Earthwork

The foundation of the Moran Building will be backfilled to various depths in all four scenarios. Scenarios one though three will be backfilled from the top of the basement slab (elevation 96) to existing grade (elevation 103). The slab will be perforated with a large drill and the subbasement levels filled with flowable fill. These activities will allow ground water to move through the various slabs and serve as a good foundation for the soil backfill. 75% of the soil excavated onsite will be used as backfill. The remaining 25% are assumed to unsuitable and hauled offsite for disposal. CCI proposed to use a granular borrow as backfill. The material will be transported to the site, placed in lifts, and compacted. Six inches of soil will be removed from the entire site and transported to an appropriate landfill for dispose. This will ensure any debris is captured and disposed of appropriately.

Restoration

Six inches of Antilitically Verified "Clean" Topsoil will be spread over all disturbed areas and seed and mulch spread. Once sufficient germination is in place, the erosion control measures can be removed along with the fence and all other project related items.

5.10.2 Clay Point Associates Narrative

Specification Information Related to the Cost ESTIMATION for Potential Building Demolition
Asbestos, Lead-Based Paint & PCB's in Building Materials
February 23, 2017

Professional Environmental Inspection Services

Comprehensive Asbestos Inspection

CPAI has reviewed certain reports of past asbestos inspection activities performed on/within the Plant. Based on our report review and on-site observations, it is apparent that an acceptable comprehensive asbestos inspection has not been performed. CPAI observed suspect asbestos materials on-site that have not been evaluated. In accordance with State and Federal regulations, the building must be inspected for all suspect asbestos materials, both accessible and inaccessible, prior to demolition. Previous results from past inspection activities may be integrated into the comprehensive report.

The unique challenge of performing a quality asbestos inspection in the Moran Plant is access to the upper portions of the building. For instance, the upper window sashes remain present in some openings. Therefore, there is likely suspect window glazing present. In addition, all window openings likely have suspect caulking materials present. Finally, the upper roof is comprised of suspect felts, flashings and tars. At this time, the City cannot ensure that there is safe access to the upper levels from inside the building. Therefore, an engineering study may need to be performed to determine if stairs and catwalks are safe and/or exterior access may be necessary, for instance, by crane, lift or similar.

The low cost estimate includes the assumption that all suspect materials at the upper portions of the building are assumed to be asbestos containing materials. This approach reduces the inspection cost but has other cost implications that are factored in the asbestos abatement cost ranges. The high cost estimate attempts to estimate the cost of measures necessary to gain safe access to all upper portions of the building.

On January 27, 2017, CPAI conducted a limited asbestos inspection activity to evaluate all poured concrete, concrete masonry units (cmu or cement block), brick and associated mortars. These materials

are considered suspect and presence of asbestos in these materials would significantly increase the cost of building demolition. Therefore, there was significant value in evaluating these suspect materials as part of this cost estimation activity. All cementitious building materials sampled by CPAI were reported as No Asbestos Detected by a Vermont certified asbestos analytical service. The CPAI report of limited asbestos inspection is attached.

PCB Building Materials Inspection

CPAI was not provided with any reports of past PCB's in building materials inspections performed on/within the Plant.

In accordance with applicable State and Federal regulations, building materials known to potentially contain PCB's must be evaluated for PCB content. Information from the PCB building material inspection determines the recycling/disposal status of each building material or building material substrate that is coated with paint or similar.

Issues related to access to the upper portions of the building also apply to the PCB building materials inspection. Cost estimates related to addressing these issues are included in the comprehensive asbestos inspection line item.

On February 13, 2017, CPAI conducted a limited PCB sampling exercise of representative coatings (paints) on certain substrates within the Plant. Seven (7) samples were analyzed for presence of Polychlorinated Biphenyl's (PCB's). Building materials that are covered with PCB containing coatings cannot be recycled and must be disposed off-site. Presence of PCB's would significantly increase the cost of building demolition. Therefore, there was significant value in screening certain coatings as part of this cost estimation activity. The analytical service has reported that five (5) of the seven (7) paint samples contained PCB's. Two (2) samples were reported as below the analysis method level of detection (i.e., no PCB's). The concentration in positive samples ranged from 3.9 – 17 mg/kg (ppm). PCB's were present in coatings on cementitious substrates and structural steel. The CPAI report of limited PCB's in building materials inspection is attached.

Results from the limited PCB sampling exercise have determined the following:

- All coatings within the building must be assumed to contain PCB's until a comprehensive PCB building materials inspection is completed. Further inspection may or may not determine that significant portions of the building contain non-PCB coatings. This information may or may not be relevant due to potential comingling of building materials during the demolition activity.
- The location of known PCB containing coatings dictates that cementitious building materials cannot be processed on-site and used as backfill or distributed to other construction sites. Cementitious building materials must be disposed properly. Removal/disposal is not bound by the requirements of the USEPA Toxic Substances Control Act (TOSCA). Disposal, however, must be performed in accordance with applicable regulations. CPAI has communicated this information to Casella Construction, Inc. This information is reflected in their demolition cost estimates.
- The location of known PCB containing coatings in the Plant dictates that structural steel cannot be recycled. Structural steel must be disposed properly. Removal/disposal is not bound by the requirements of the USEPA Toxic Substances Control Act (TOSCA). Disposal, however, must be performed in accordance with applicable regulations. CPAI has communicated this information to Casella Construction, Inc. This information is reflected in their demolition cost estimates.

- CPAI has conducted an informal cost/benefit analysis to compare the cost of removing all PCB containing coatings from cementitious and steel substrates prior to demolition vs. the cost of disposal instead of processing/recycling. For cost reasons and other unknown factors that may increase cost during the removal activity, it is our opinion that building material removal/ disposal represents the lowest cost option. It will be appropriate to conduct a more formal cost/benefit analysis at the time of building demolition to confirm/refute this opinion.

The PCB Building Materials Inspection cost estimates include evaluation of caulking, glazing and other building materials known to potentially contain PCB's.

Comprehensive Lead-Based Paint Inspection

CPAI has reviewed a report of a past lead-based paint inspection performed by paint chip sample collection/analysis. This activity was limited in scope and did not represent a comprehensive lead-based paint inspection.

There is no regulatory requirement to perform a lead-based paint inspection prior to building demolition. Information from the lead-based paint inspection, however, dictates the endpoint of certain building materials and fulfills disclosure requirements relative to recycling of certain building materials.

Issues related to access to the upper portions of the building also apply to the lead-based paint inspection. Cost estimates related to addressing these issues are included in the comprehensive asbestos inspection line item.

Comprehensive Lead-Based Paint Inspection (cont.)

On February 13, 2017, CPAI conducted a limited lead-based paint inspection of representative coatings on certain substrates within the Plant. Specifically, certain cementitious building materials and structural steel components within the building were evaluated by X-Ray Fluorescence Analyzer (XRF). Structural steel at the Exterior of the building was not evaluated. Cementitious building materials that are coated with lead-based paint cannot be processed on-site and used as backfill or distributed to other construction sites. Presence of lead-based paint would significantly increase the cost of building demolition. Therefore, there was significant value in screening certain coatings as part of this cost estimation activity. CPAI has determined that paint at structural steel testing locations is lead-based paint. CPAI has determined that paint at cementitious building material testing locations is not lead-based paint. The CPAI report of limited lead-based paint inspection is attached.

Results from the limited lead-based paint inspection have determined the following:

- All coatings on structural steel within the building must be assumed to contain lead-based paint until a comprehensive lead-based paint inspection is completed. Further inspection may or may not determine that all structural steel is coated with lead-based paint. Structural steel that is coated with lead-based paint may be recycled. The lead-based paint inspection report must be provided to the recycler. If there are structural steel components that are not coated with lead-based paint, they may or may not have PCB's in the coatings. Refer to the PCB Building Materials Inspection for further discussion.
- Although CPAI has learned that all tested cementitious building materials are not coated with lead-based paint. This seems unusual due to the age of the building. A comprehensive lead-based paint inspection will support or refute the conclusions that have been made as a result of the limited lead-based paint inspection. The absence of lead-based paint on cementitious building materials dictates that cementitious building materials may be processed on-site and used as

backfill or distributed to other construction sites. Cementitious building materials that are not coated with lead-based paint may or may not have PCB's in the coatings. Refer to the PCB Building Materials Inspection for further discussion.

- CPAI has conducted an informal cost/benefit analysis to compare the cost of removing all PCB/lead-based coatings from cementitious and steel substrates prior to demolition vs. the cost of disposal instead of processing/recycling. For cost reasons and other unknown factors that may increase cost during the removal activity, it is our opinion that building material removal/disposal represents the lowest cost option. It will be appropriate to conduct a more formal cost/benefit analysis at the time of building demolition to confirm/refute this opinion.

Lead TCLP Update

CPAI was not provided with any reports of past demolition waste characterization activities performed on/within the Plant.

In accordance with applicable State and Federal regulations, and at the request of most landfills, the demolition waste stream must be characterized for available lead (Pb). Specifically, performance of a Toxicity Characteristic Leachate Procedure (TCLP) for lead (Pb) must be performed prior to building demolition. Information from the lead TCLP activity determines the disposal status of each building material or building material substrate that is coated with paint or similar.

Issues related to access to the upper portions of the building also apply to future lead TCLP activities. Cost estimates related to addressing these issues are included in the comprehensive asbestos inspection line item.

On February 13, 2017, CPAI conducted lead TCLP sampling of the future demolition waste stream, excluding structural steel, which was intended to be recycled. An analysis result below the regulatory threshold means that demolition debris may be disposed as construction/ demolition waste. An analysis result above the regulatory threshold means that all demolition debris must be disposed as lead hazardous waste or specific components coated with lead-based paint must be segregated from the waste stream and disposed as lead hazardous waste. A TCLP analysis result above the regulatory threshold would significantly increase the cost of building demolition. Therefore, there was significant value in performing lead TCLP sampling/ analysis as part of this cost estimation activity. The Vermont certified analytical service has reported that the TCLP sample was below the analytical method level of detection (i.e., no lead). The CPAI report of TCLP activity is attached.

Results from the TCLP sampling exercise have determined the following:

- If building demolition was performed within the next year and building materials were disposed off-site, all building demolition debris could be disposed as construction/demolition waste relative to presence of lead in coatings. Coatings may or may not have PCB's. Refer to the PCB Building Materials Inspection for further discussion. CPAI has communicated this information to Casella Construction. This information is reflected in their demolition cost estimates.

The lead TCLP update cost estimates are presented in case building demolition is performed after February 13, 2018. Further deterioration of building materials/coatings over the next year would mean that the TCLP test should be duplicated to update past results. Future TCLP testing should also include structural steel if this building component is to be disposed.

Asbestos Containing Materials

General

CPAI has performed a very limited inspection of cmu at the Exterior walls of the Plant for the presence of asbestos contaminated vermiculite insulation inside the void spaces of the cmu. Based on this activity, it is our opinion that there is no vermiculite insulation within the cmu. This opinion will need to be confirmed/refuted during performance of the comprehensive asbestos inspection.

Others have previously confirmed the presence of asbestos asphalt based felt paper between ceramic wall blocks around the shower area of the Bathroom on the Main Floor. CPAI has performed a very limited inspection of ceramic wall blocks at other areas in the Plant, including the Exterior walls. Based on this limited activity, it is our opinion that the asbestos felt paper is only present in the "wet walls" around the shower area. This opinion will need to be confirmed/ refuted during performance of the comprehensive asbestos inspection.

All cost estimates are based on an asbestos abatement contractor man day rate of $700./eight hour day. This figure includes labor, materials, equipment, personal protective equipment, asbestos waste disposal, personal exposure monitoring, insurance, training, certifications, permit fees, overhead and profit. This figure is indicative of market conditions in Vermont during February 2017.

Asbestos Abatement/Basement, Main Room, Hardboard

- CPAI has confirmed the presence of asbestos hardboard in three (3) locations at the ceiling of the Basement. Specifically, hardboard lines the sides of three (3) box type structures that drop down from the ceiling.
- Removal of this asbestos containing material (acm) is considered an asbestos abatement project in accordance with the Vermont Regulations for Asbestos Control (VAC).

Asbestos Abatement/Basement, Miscellaneous TSI

- CPAI has confirmed the presence of residual asbestos thermal system insulation (mudded pipe joint insulation) on some remaining pipe fittings throughout the Basement, predominantly on the west side.
- Removal of this asbestos containing material (acm) is considered an asbestos abatement project in accordance with the Vermont Regulations for Asbestos Control (VAC). The cost figures represent Vermont Department of Health approval of alternative work practices for removal by the wrap and cut method or glovebag.

Asbestos Abatement/Basement, South Room Equipment

- There is suspect electrical wiring insulation associated with electrical equipment in the South Room on the Basement Level (under the Mid Level Platform). This suspect material may or may not be acm and should be evaluated during performance of the comprehensive asbestos inspection. Cost estimates for this line item indicate no work if the suspect material is not acm. If the electrical wiring insulation is acm, removal is considered an asbestos abatement project in accordance with VRAC.
- Accuworx has included removal of the electrical equipment in their demolition cost estimates.

Asbestos Abatement/Basement, Main Room, SE, Equipment

- There is suspect electrical wiring insulation and possibly other currently inaccessible suspect materials associated with electrical equipment in the southeast section of the Main Room on the Basement Level. These suspect materials may or may not be acm and should be evaluated during performance of the comprehensive asbestos inspection. Cost estimates for this line item indicate no work if the suspect materials are not acm. If the suspect materials are acm, removal is considered an asbestos abatement project in accordance with VRAC.
- Accuworx has included removal of the electrical equipment in their demolition cost estimates.

Asbestos Abatement/Main Floor, South Room, Large Equipment

- There is suspect electrical wiring insulation, wrappings, coatings and possibly other currently inaccessible suspect materials associated with three (3) large pieces of electrical equipment in the South Room on the Main Floor. These suspect materials may or may not be acm and should be evaluated during performance of the comprehensive asbestos inspection. Cost estimates for this line item indicate no work if the suspect materials are not acm. If the suspect materials are acm, removal is considered an asbestos abatement project in accordance with VRAC.
- If acm is present in this area, removal of the electrical equipment will be performed by the asbestos abatement contractor during performance of the asbestos abatement project. It will be more cost effective to dismantle the equipment and dispose of the electrical components as asbestos waste rather than attempt to remove all coatings/wrappings, etc, from each component.
- If no acm is present, Accuworx has included removal of the electrical equipment in their demolition cost estimates.

Asbestos Abatement/Main Floor, Bathroom, Shower Area

- Others have previously confirmed the presence of asbestos asphalt based felt paper between the ceramic blocks on the walls around the shower area in the Bathroom on the Main Floor and asbestos mudded pipe joint insulation on piping above the shower area.
- Removal of these acm's is considered an asbestos abatement project in accordance with the Vermont Regulations for Asbestos Control (VAC).

Asbestos Abatement/Upper Level, North Wall, Hardboard

- Others have previously confirmed the presence of corrugated hardboard in three (3) locations on the north wall of the first catwalk level above the Main Floor. This level cannot be accessed due to safety concerns with the integrity of the catwalk inserts.
- The low cost estimate includes installation of floor decking (plywood or similar) over the floor grating to safely access the three (3) areas and conduct each project and presumes that the catwalk structure is adequate for this approach.
- If the catwalk structure is not adequate for human occupancy, staging (scaffolding) would need to be constructed from the Main Floor up to the catwalk level. Catwalk grating would be cut away to gain access. The cost for this approach is included in the high cost estimate.

Asbestos Abatement/Interior, Misc. Electrical Wiring Insulation

- There is suspect electrical wiring insulation throughout the Plant. This suspect material may or may not be acm and should be evaluated during performance of the comprehensive asbestos

inspection. Cost estimates for this line item indicate no work if the suspect materials are not acm. If the suspect materials are acm, removal is considered an asbestos abatement project in accordance with VRAC.

- The high cost estimate assumes Vermont Department of Health approval of alternative work practices for removal of wiring without establishment of containment areas.
- It is possible that electrical wiring with asbestos insulation exists in upper areas of the Plant that cannot be accessed by an inspector or abatement contractor due to safety concerns. If this scenario exists for electrical wiring insulation or any other acm, the approach will need to be performance of building demolition using wet methods, periodic examination of the demolition debris for suspect materials and proper asbestos abatement if acm's are found to be present. This approach would require approval by the USEPA and the Vermont Department of Health

Asbestos Abatement/Exterior, Window Caulking & Glazing

- Others have previously confirmed the presence of asbestos caulking associated with lower windows. There is presumably suspect asbestos caulking and glazing associated with upper windows. These suspect materials may or may not be acm and should be evaluated during performance of the comprehensive asbestos inspection.
- Removal of the acm's is considered an asbestos abatement project in accordance with the Vermont Regulations for Asbestos Control (VAC).
- The cost figures represent Vermont Department of Health approval of alternative work practices for removal of caulking/glazing without establishment of containment areas.
- The low cost figure includes removal of asbestos window caulking from the lower levels only (Basement and Main Floor windows).
- The high cost estimate includes removal of all window caulking/glazing and includes a factor for safe access to the windows from the Exterior.

Asbestos Abatement/Exterior, North Steel Structures

- Others have previously confirmed the presence of asbestos gaskets, gasket ropes and caulking associated with structural steel at the North Elevation.
- Removal of the acm's is considered an asbestos abatement project in accordance with the Vermont Regulations for Asbestos Control (VAC).
- The cost figures represent Vermont Department of Health approval of alternative work practices for removal of the acm's without establishment of containment areas. If containment is required around the entire steel structure, the abatement cost will increase significantly.
- CPAI could not access this area during our site visits. The previous report does not provide any information concerning the specific location of the acm's. Therefore, we are unclear of the extent of acm's present. In addition, we have been told by a person of interest that asbestos TSI debris remains on the ground (roof) under the steel structure.
- The low cost estimate includes removal of acm's from the lower levels only (ground and Main Floor footprint).
- The high cost estimate includes removal of all acm's and includes a factor for safe access to the steel structure from the Exterior.

Asbestos Abatement/Exterior, Roof

- Others have previously confirmed the presence of asbestos roof flashing on a lower roof.

- There is presumably suspect asbestos roofing materials associated with other roof surfaces. These suspect materials may or may not be acm and should be evaluated during performance of the comprehensive asbestos inspection.
- Removal of the acm's is considered a Section 6 asbestos activity in accordance with the Vermont Regulations for Asbestos Control (VAC).
- The low cost estimate includes removal of asbestos roof flashing only.
- The high cost estimate includes removal of all roofing materials and includes a factor for safe access to the roof surfaces from the Exterior.
- Cost figures assume that all roof surfaces are safe for human occupancy and will support traditional asbestos removal methods. If roof surfaces have failed and cannot be accessed safely, the entire approach to building demolition will need to be re-considered. The alternative approach would involve building demolition using wet methods, meticulous segregation of the acm from the collapsed and comingled demolition debris and/or live loading of all demolition debris/disposal as asbestos waste. This approach would require approval by the USEPA and the Vermont Department of Health.

Lead-Based Paint

At this point in time, there is no need to perform lead-based paint abatement in conjunction with building demolition.

PCB's in Building Materials

<u>Coatings/Paint Removal, Basement, Remaining Building Materials (Scenario's #1 and #2)</u>

- It is possible that PCB containing coatings (paint) may need to be removed from all building substrates that will be left in place under Demolition Scenario's #1 and #2.
- If paint removal is required, the initial removal method will be abrasive blasting. The high cost estimates reflect use of this process. We have discussed this item with The Johnson Company, Inc. They have included confirmatory testing costs in their cost estimates.
- It is known that PCB's can leach into porous surfaces, such as poured concrete. Abrasive blasting may or may not be acceptable. To achieve the acceptable standard of <1 mg/kg for structures left on-site, additional abatement may be required. The method for further abatement would be scarification of the concrete. The cost for scarification is not included in the high cost estimates but would significantly affect project cost.

<u>Building Material Removal & Disposal</u>

- In addition to paint/coatings, there are additional building materials present that may or may not contain PCB's. These materials, and other coatings, should be evaluated during performance of the PCB building materials inspection.
- Building materials that contain PCB's in quantities less than 50 mg/kg (ppm) do not need to be removed from the building prior to demolition assuming that the disposal facility accepting the demolition debris has been informed of the presence of PCB's and has approved disposal with this knowledge.
- The low cost estimate assumes that there are no building materials present with PCB concentrations greater than 50 mg/kg (ppm).
- The high cost estimate provides a factor in case a building material(s) is found to be present with PCB concentrations greater than 50 mg/kg (ppm). The estimate includes removal and disposal. CPAI has no way of knowing at this time if the high cost estimate would apply and to what extent

PCB building material removal would be required. Therefore, this placeholder amount could change significantly.

Professional Services Related to Abatement/Demolition

Project Planning/Design/Contractor Bid Process Administration

- This figure includes project planning, project meetings, project management, on-site pre-design work, development of the project Design Document (bid documents and specifications), assistance with invitation to bid, administration of an on-site pre-bid conference/site inspection, development/distribution of necessary Addenda to the Design Document, review of contractor bid packages, development of a written bid summary and assistance with contractor selection.
- The cost estimates have been developed using a rate of $70./hour for field work and project management and $100./hour for project design.
- The cost estimates include asbestos abatement and PCB paint removal projects.

Project Monitoring/Project Management/Clearance Procedures/Reporting

- This figure includes project management, random/limited on-site project monitoring, administration of periodic job meetings, performance of clearance visual inspections, performance of clearance air sample collection/analysis (PCM) and all reporting for all necessary projects.
- The cost estimates have been developed using a rate of $70./hour for project monitoring and reporting and $100./hour for project management.

NESHAPs Compliance During Building Demolition

- It is possible that all acm's on/within the Plant cannot be accessed by an inspector or abatement contractor due to safety concerns or failure of certain building substrates from deterioration over time. If this scenario exists, the approach will need to be performance of building demolition using wet methods, periodic examination of the demolition debris for suspect materials and proper asbestos abatement/disposal if acm's are found to be present.
- The USEPA National Emissions Standard for Hazardous Air Pollutants (NESHAPs) requires that a individual trained in the provisions of NESHAPs be on-site during building demolition in the event additional suspect asbestos materials are encountered. The scenario described above would require the individual to be a Vermont certified Asbestos Inspector. CPAI recommends that an independent, third party professional be on-site during building demolition to fulfill this requirement. In addition, presence of this independent professional will allow for monitoring of the demolition contractor to encourage performance of demolition without dust generation. Proper wetting during demolition is a critical component to the success of the demolition project.
- If additional acm is found to be present during demolition, all work must stop and proper asbestos abatement must be performed. The need for additional asbestos abatement may significantly increase the project cost.
- CPAI has communicated with Casella Construction, Inc. concerning the estimated duration of the demolition component of the project when building materials will be physically removed (dropped). They have estimated four (4) - eight (8) weeks depending on numerous on-site factors. CPAI has used eight (8) weeks to develop the cost estimates. Once the building has been removed (dropped) and the status of asbestos suspect materials is known, there will be no need for on-site professional monitoring.
- The cost estimates have been developed using a rate of $70./hour for project monitoring on-site and $100./hour for project management.

5.10.3 Accuworx Inc. Narrative

Project narrative for Moran Building contaminated/impacted waste removal, transportation & disposal

Scenario #1-3:
PCB waste sampling & analysis will be performed on electrical equipment for the purposes of a proper waste characterization analysis. This sampling will be done on identified electrical equipment identified on the second-floor electrical room containing three (3) large "electric isolators". Electrical motors & other equipment is located in the basement which will require sampling and analysis performed to detect the presence of PCB's. The attached budgetary estimate assumes that there exists no TSCA regulated PCB's present on this site.

Upon confirmation of non-PCB analysis, all the above mentioned electrical equipment shall be collected, packaged for proper DOT transportation and disposed of at a licensed electrical component recycling facility.

The large "electric isolators" will need to be removed from the second floor using an 85-ton crane. These units will be removed from the building, secured on to a flatbed trailer and sent out to a licensed electrical component recycling facility.

Using hydraulic scissor lifts, Accuworx personnel will remove the mercury vapor lamps, fluorescent light bulbs and any other Universal Wastes located in the ceiling of the building. These items will be removed, packaged into DOT approved shipping containers and recycled at a licensed Universal Waste recycling facility.

Scenario #4:

Sediment will be removed using a Hydro Excavator Vac truck. Accuworx will make entry into the OSHA defined confined spaces beneath the basement sub floor. Dewatering of groundwater in tunnels will be performed using double diaphragm pumps to transfer water into a 21K frac tank(s). This water will be processed through a portable GAC water treatment trailer to remove organic contaminants prior to discharging to a to-be-identified receptor designed to accept the effluent. Any and all Federal, State or Local permits or authorizations for water discharge are to obtained by others (assumed Consultant). The sediment and sludge will be allowed to drain and dry prior to shipping offsite as a RCRA defined characteristic (8 RCRA Metals) hazardous waste in dump trailers. The sediment will be stockpiled on and under poly plastic sheeting. Any water draining from this pile will be collected and transferred into frac tank for onsite treatment. The waste sludge material will be shipped to Canada to a licensed hazardous waste treatment facility.

5.10.4 Demolition Estimates

Demolition - Moran Plant Scenario 1					
Item:	**Quantity:**	**Units:**	**Unit Cost:**	**Low Cost Estimate**	**High Cost Estimate (5% Contingency Added)**
General Conditions					
Management, Office Trailer, Tools, Misc. expenses	1	lump sum	$ 260,000	$ 260,000	$ 273,000
Mobilization/ Demobilization	1	lump sum	$ 60,000	$ 60,000	$ 63,000
Site Preparation					
Chain Link Fence/ Perimeter Fence W/ Screen	1,200	lf	$ 15	$ 18,000	$ 18,900
Traffic Control (at bike path)	80	day	$ 300	$ 24,000	$ 25,200
Erosion Control					
Construction Entrance	1	ea	$ 3,000	$ 3,000	$ 3,150
Wire Backed Silt Fence	2,000	lf	$ 5	$ 10,000	$ 10,500
Sediment Boom	300	lf	$ 25	$ 7,500	$ 7,875
Building Demolition					
Soft Strip Building Interior	1	lump sum	$ 40,000	$ 40,000	$ 42,000
Dust Control	1	lump sum	$ 90,000	$ 90,000	$ 94,500
Mass Demolition	1	sf	$ 475,000	$ 475,000	$ 498,750
Dispose of Brick & Concrete Masonry Units	2,800	ton	$ 125	$ 350,000	$ 367,500
Dispose of Cast-in-Place Concrete	5,400	ton	$ 125	$ 675,000	$ 708,750
Dispose of Construction and Demolition Material	250	ton	$ 125	$ 31,250	$ 32,813
Dispose of Structural Steel	600	ton	$ 125	$ 75,000	$ 78,750
Earthwork					
Install Flowable Fill Below Slab	800	cy	$ 120	$ 96,000	$ 100,800
Perforate Slab and Mud Mat	1	lump sum	$ 20,000	$ 20,000	$ 21,000
Install Structural Backfill	4,600	cy	$ 30	$ 138,000	$ 144,900
Restoration					
Remove 6 Inches of Soil Within 50 Feet of Building	780	ton	$ 125	$ 97,500	$ -
Remove 18 Inches of Soil Within 50 Feet of Building	2,340	ton	$ 125	$ -	$ 292,500
Analytically Verified "Clean" Topsoil, 6-inch isolation barrier	800	cy	$ 75	$ 60,000	$ -
Analytically Verified "Clean" Topsoil, 18-inch isolation per proposed IRule	2,400	cy	$ 75	$ -	$ 180,000
Seed and Mulch	1	lump sum	$ 5,000	$ 5,000	$ 5,250
Payment and Performance Bonds (5% of Project Cost)				$ 126,763	$ 148,457
	Total Estimate Demolition Cost			***$ 2,662,013***	***$ 3,117,594***
Demolition Assumptions					
High Cost Estimate includes a 5% contingency on all costs.					
All asbestos is removed from the building prior to demolition					
Assumes roof is removed by others					
All permits and fees are by others					
Pumping and treating of groundwater by others					
Soil compaction testing by others					
Pumps and other equipment are cleaned or removed and disposed of by other prior to demolition					
Dust monitoring by others					
Assumes all painted masonry is Non TSCA PCB <50 ppm					

Asbestos/ LBP / PCB Building Materials		
ITEM:	**Low Cost Estimate**	**High Cost Estimate**
Professional Environmental Inspection Services		
Comprehensive Asbestos Inspection	$ 4,500	$ 21,000
PCB Building Materials Inspection	$ 7,200	$ 7,200
Comprehensive Lead-Based Paint Inspection	$ 2,500	$ 2,500
Lead TCLP Update	$ 850	$ 850
Asbestos Containing Materials		
Asbestos Abatement/Basement, Main Room, Hardboard	$ 16,600	$ 16,600
Asbestos Abatement/Basement, Miscellaneous TSI	$ 3,100	$ 3,100
Asbestos Abatement/Basement, South Room, Equipment	No Work	$ 2,800
Asbestos Abatement/Basement, Main Room, SE, Equipment	No Work	$ 5,250
Asbestos Abatement/Main Floor, South Room, Large Equipment	No Work	$ 17,600
Asbestos Abatement/Main Floor, Bathroom, Shower Area	$ 9,350	$ 9,350
Asbestos Abatement/Upper Level, North Wall, Hardboard	$ 33,180	$ 55,000
Asbestos Abatement/Interior, Misc. Electrical Wiring Insulation	No Work	$ 7,000
Asbestos Abatement/Exterior, Window Caulking & Glazing	$ 13,500	$ 72,200
Asbestos Abatement/Exterior, North Steel Structures	$ 28,000	$ 72,000
Asbestos Abatement/Exterior, Roof	$ 42,300	$ 157,500
Asbestos Abatement/Contingency (10%)	$ 16,108	$ 44,995
Asbestos Abatement/Project Bonds (5%)	$ 8,054	$ 22,498
Lead-Based Paint		
Lead-Based Paint Abatement	No Work	No Work
PCB's in Building Materials		
Paint/Coatings Removal, Basement, Remaining Bldg. Materials	No Work	$ 140,000
Building Material Removal & Disposal	No Work	$ 20,000
Building Material Removal & Disposal/Contingency (10%)	n/a	$ 16,000
Building Material Removal & Disposal/Project Bonds (5%)	n/a	$ 8,000
Professional Services Related to Abatement/Demolition		
Project Planning/Design/Contractor Bid Process Admin.	$ 7,500	$ 7,500
Project Monitoring/Project Mgmt./Clearance Procedures	$ 12,700	$ 29,700
NESHAPs Compliance During Building Demolition	$ 24,500	$ 24,500
Total Estimate ACM, Lead Paint, and PCB Building Materials Cost	***$ 229,942***	***$ 763,143***

Demolition - Moran Plant Scenario 1 - continued

Transportation and Disposal of Additional Remediation Waste

Item:	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Hazardous Waste Transport & Disposal (soil, brick & concrete)						
Waste Disposal (unexpected findings - vol. estimates only)	0	5	yrd	$ 275	$ -	$ 1,375
Transportation-25 yard dump trailers (28 ton/load min)	0	0	load	$ 2,750	$ -	$ -
Electrical Equipment Removal & Disposal						
Supervisor	2	2	day	$ 700	$ 1,400	$ 1,400
Technician x 2 men	2	2	day	$ 1,200	$ 2,400	$ 2,400
Electrical Equipment precharacterization and PCB analysis sampling & testing	5	10	samples	$ 175	$ 875	$ 1,750
Utility Truck	2	2	day	$ 300	$ 600	$ 600
85 Ton Crane	1	1	day	$ 4,975	$ 4,975	$ 4,975
Flat Bed Trailer	1	1	day	$ 1,350	$ 1,350	$ 1,350
Electrical Equipment Recycling (Assumed Non-PCB Containing Equipment)	1	1	lump sum	$ 3,500	$ 3,500	$ 3,500
Electrical Equipment in the basement (pumps) Non-Asbestos, Non PCB equipment	1		lump sum	$ 2,000	$ 2,000	$ -
Electrical Equipment (PCB's> 50 PPM<500 PPM) if needed		1	lump sum	$ 12,000	$ -	$ 12,000
Television (CRT's)	5	5	unit	$ 100	$ 500	$ 500
Fluorescent Light Bulbs	3	5	box	$ 45	$ 135	$ 225
Mercury Vapor Light Bulbs Removal, Transportation & Disposal (Universal Waste)						
Labor & Equipment for Removal						
Supervisor	16	16	hr	$ 70	$ 1,120	$ 1,120
Technician	16	16	hr	$ 60	$ 960	$ 960
Utility Truck	2	2	day	$ 150	$ 300	$ 300
Hydraulic Man Lift Mob./Demob.	2	2	each	$ 200	$ 400	$ 400
Hydraulic Lift	1	1	day	$ 425	$ 425	$ 425
Level C PPE	2	2	day	$ 100	$ 200	$ 200
Waste Disposal (estimated weight)	150	200	lbs	$ 8	$ 1,125	$ 1,500
Transportation	1	1	unit	$ 150	$ 150	$ 150
Payment and Performance Bonds (5% of Project Cost)					$ 1,121	$ 1,757
Total Estimate for Haz Waste Management and Disposal					***$ 23,536***	***$ 36,887***

Qualified Environmental Professional Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
CAP Revisions, Regulatory Coordination	45	65	hr	$ 85	$ 3,825	$ 5,525
Preparation, Pre-Construction Planning, Health and Safety, Logistics	20	30	hr	$ 120	$ 2,400	$ 3,600
Topsoil Verification Sampling (2 proposed sites), Reg. Approval	2	3	sites	$ 1,500	$ 3,000	$ 4,500
Confirmatory PCB Sampling (Soil surrounding project area), sample unit price includes field work, lab analysis, equipment, reporting, and management	20	40	samples	$ 167	$ 3,340	$ 6,680
Confirmatory PCB Sampling (Concrete in basement to be buried) sample unit price includes field work, analytical, reporting, and management costs	35	65	samples	$ 167	$ 5,845	$ 10,855
TSCA Compliance	15	40	hr	$ 120	$ 1,800	$ 4,800
QEP Oversight and Daily Reporting (4 months - 6 day/wk ~ 10 hr/days)	600	1,000	hr	$ 75	$ 45,000	$ 75,000
Field Expenses - travel, mileage, consumables, equipment, misc.	60	100	day	$ 250	$ 15,000	$ 25,000
QEP Management, Regulatory Corresp., Meetings (4 months)	100	140	hr	$ 120	$ 12,000	$ 16,800
Dust Monitoring -Dust Trak 8520 (4 units - 4 months - 6 day/wk)	12	16	week	$ 2,600	$ 31,200	$ 41,600
Completion Reporting	45	70	hr	$ 120	$ 5,400	$ 8,400
Total Estimate for QEP Services					***$ 128,810***	***$ 202,760***

Resident Engineering Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Preparation, Pre-Construction Planning	20	30	hr	$ 75	$ 1,500	$ 2,250
RE Services / Demo Oversight (4 months - 6 day/wk ~ 10 hr/days)	600	1,000	hr	$ 75	$ 45,000	$ 75,000
Field Expenses - travel, mileage, consumables, equipment, misc.	60	100	day	$ 150	$ 9,000	$ 15,000
Vibration Monitoring during Demolition	3	4	sensors	$ 1,500	$ 4,500	$ 6,000
Noise Monitoring - decibel meter	1	1	unit	$ 350	$ 350	$ 350
Pre-construction survey of surrounding buildings	1	2	unit	$ 1,100	$ 1,100	$ 2,200
Compaction Testing (assumes ~2 weeks of backfill)	2	3	week	$ 5,000	$ 7,500	$ 12,500
Total Estimate for RE Services					***$ 68,950***	***$ 113,300***

Additional Expenses

Historic Preservation / Compliance					$ 10,000	$ 15,000
Permitting - zoning permit only - no building or trades permits					$ 19,211	$ 25,725
Bid Package Preparation Services - (Assumes 7.5% of Demo, Abatement, and Remediation)					$ 218,662	$ 293,822
Contingency (assumed High Risk @ 15%)					$ 466,988	$ 635,053
Administrative-City Staff (assumed 5% of project cost, subject to change based on additional information)					$ 155,663	$ 211,684
Total Estimate for Additional Expenses					***$ 870,523***	***$ 1,181,283***
					Low Est.	***High Est.***
Scenario 1 Total Estimated Cost					***$ 3,983,773***	***$ 5,414,966***

Demolition - Moran Plant Scenario 2

Item:	Quantity:	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate (5% Contingency Added)
General Conditions					
Management, Office Trailer, Tools, Misc. Expenses	1	lump sum	$ 300,000	$ 300,000	$ 315,000
Mobilization/ Demobilization	1	lump sum	$ 70,000	$ 70,000	$ 73,500
Site Preparation					
Chain Link Fence/ Perimeter Fence W/ Screen	1,200	lf	$ 15	$ 18,000	$ 18,900
Traffic Control (at bike path)	100	day	$ 300	$ 30,000	$ 31,500
Erosion Control					
Construction Entrance	1	ea	$ 3,000	$ 3,000	$ 3,150
Wire Backed Silt Fence	2,000	lf	$ 5	$ 10,000	$ 10,500
Sediment Boom	300	lf	$ 25	$ 7,500	$ 7,875
Building Demolition					
Soft Strip Building Interior	1	lump sum	$ 40,000	$ 40,000	$ 42,000
Sawcut Foundation at Elevation 110	530	lf	$ 30.00	$ 15,900	$ 16,695
Dust Control	1	lump sum	$100,000	$ 100,000	$ 105,000
Mass Demolition	1	sf	$550,000	$ 550,000	$ 577,500
Dispose of Brick & Concrete Masonry Units	2,800	ton	$ 125	$ 350,000	$ 367,500
Dispose of Cast-in-Place Concrete	5,600	ton	$ 125	$ 700,000	$ 735,000
Dispose of Construction and Demolition Material	250	ton	$ 125	$ 31,250	$ 32,813
Dispose of Structural Steel	600	ton	$ 125	$ 75,000	$ 78,750
Earthwork					
Install Flowable Fill Below Slab	800	cy	$ 120	$ 96,000	$ 100,800
Perforate Slab and Mud Mat	1	lump sum	$ 20,000	$ 20,000	$ 21,000
Install Structural Backfill	4,600	cy	$ 30	$ 138,000	$ 144,900
Restoration					
Remove 6 Inches of Soil Within 50 Feet of Building	780	ton	$ 125	$ 97,500	$ -
Remove 18 Inches of Soil Within 50 Feet of Building	2,340	ton	$ 125	$ -	$ 292,500
Analytically Verified "Clean" Topsoil, 6-inch isolation barrier	800	cy	$ 75	$ 60,000	
Analytically Verified "Clean" Topsoil, 18-inch isolation per proposed IRule	2,400	cy	$ 75	$ -	$ 180,000
Seed and Mulch	1	lump sum	$ 5,000	$ 5,000	$ 5,250
Payment and Performance Bonds (5% of Project Cost)				$ 135,857.50	$ 158,007
		Total Estimate Demolition Cost		***$ 2,853,008***	***$ 3,318,139***

Demolition Assumptions

- High Cost Estimate includes a 5% contingency on all costs
- All asbestos is removed from the building prior to demolition
- Assumes roof is removed by others
- All permits and fees are by others
- Pumping and treating of groundwater by others
- Soil compaction testing by others
- Pumps and other equipment are cleaned or removed and disposed of by other prior to demolition
- Dust monitoring by others
- Assumes all painted masonry is Non TSCA PCB <50 ppm

Asbestos/ LBP / PCB Building Materials

ITEM:	Low Cost Estimate	High Cost Estimate
Professional Environmental Inspection Services		
Comprehensive Asbestos Inspection	$ 4,500	$ 21,000
PCB Building Materials Inspection	$ 7,200	$ 7,200
Comprehensive Lead-Based Paint Inspection	$ 2,500	$ 2,500
Lead TCLP Update	$ 850	$ 850
Asbestos Containing Materials		
Asbestos Abatement/Basement, Main Room, Hardboard	$ 16,600	$ 16,600
Asbestos Abatement/Basement, Miscellaneous TSI	$ 3,100	$ 3,100
Asbestos Abatement/Basement, South Room, Equipment	No Work	$ 2,800
Asbestos Abatement/Basement, Main Room, SE, Equipment	No Work	$ 5,250
Asbestos Abatement/Main Floor, South Room, Large Equipment	No Work	$ 17,600
Asbestos Abatement/Main Floor, Bathroom, Shower Area	$ 9,350	$ 9,350
Asbestos Abatement/Upper Level, North Wall, Hardboard	$ 33,180	$ 55,000
Asbestos Abatement/Interior, Misc. Electrical Wiring Insulation	No Work	$ 7,000
Asbestos Abatement/Exterior, Window Caulking & Glazing	$ 13,500	$ 72,200
Asbestos Abatement/Exterior, North Steel Structures	$ 28,000	$ 72,000
Asbestos Abatement/Exterior, Roof	$ 42,300	$ 157,500
Asbestos Abatement/Contingency (10%)	$ 16,108	$ 44,995
Asbestos Abatement/Project Bonds (5%)	$ 8,859	$ 24,747
Lead-Based Paint		
Lead-Based Paint Abatement	No Work	No Work
PCB's in Building Materials		
Paint/Coatings Removal, Basement, Remaining Bldg. Materials	No Work	$ 99,300
Building Material Removal & Disposal	No Work	$ 20,000
Building Material Removal & Disposal/Contingency (10%)	n/a	$ 11,930
Building Material Removal & Disposal/Project Bonds (5%)	n/a	$ 5,965
Professional Services Related to Abatement/Demolition		
Project Planning/Design/Contractor Bid Process Admin.	$ 7,500	$ 7,500
Project Monitoring/Project Mgmt./Clearance Procedures	$ 12,700	$ 29,700
NESHAPs Compliance During Building Demolition	$ 24,500	$ 24,500
Total Estimate ACM, Lead Paint, and PCB Building Materials Cost	***$ 230,747***	***$ 718,587***

Demolition - Moran Plant Scenario 2 - continued

Transportation and Disposal of Additional Remediation Waste

Description / Item:	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Hazardous Waste Transport & Disposal (soil, brick & concrete)						
Waste Disposal	0	10	yrd	$ 275	$ -	$ 2,750
Transportation-25 yard dump trailers (28 ton/load min)	0	0	load	$ 2,750	$ -	$ -
Electrical Equipment Removal & Disposal						
Supervisor	2	2	day	$ 700	$ 1,400	$ 1,400
Technician x 2 men	2	2	day	$ 1,200	$ 2,400	$ 2,400
Electrical Equipment precharacterization and PCB analysis sampling & tes	5	10	samples	$ 175	$ 875	$ 1,750
Utility Truck	2	2	day	$ 300	$ 600	$ 600
85 Ton Crane	1	1	day	$ 4,975	$ 4,975	$ 4,975
Flat Bed Trailer	1	1	day	$ 1,350	$ 1,350	$ 1,350
Electrical Equipment Recycling (Assumed Non-PCB Containing Equipment)	1	1	lump sum	$ 3,500	$ 3,500	$ 3,500
Electrical Equipment in the basement (pumps) Non-Asbestos, Non PCB equipment	1		lump sum	$ 2,000	$ 2,000	
Electrical Equipment (PCB's> 50 PPM<500 PPM) if needed		1	lump sum	$ 12,000	$ -	$ 12,000
Television (CRT's)	5	5	unit	$ 100	$ 500	$ 500
Fluorescent Light Bulbs	3	5	box	$ 45	$ 135	$ 225
Mercury Vapor Light Bulbs Removal, Transportation & Disposal (Universal Waste)						
Labor & Equipment for Removal						
Supervisor	16	16	hr	$ 70	$ 1,120	$ 1,120
Technician	16	16	hr	$ 60	$ 960	$ 960
Utility Truck	2	2	day	$ 150	$ 300	$ 300
Hydraulic Man Lift Mob./Demob.	2	2	each	$ 200	$ 400	$ 400
Hydraulic Lift	1	1	day	$ 425	$ 425	$ 425
Level C PPE	2	2	day	$ 100	$ 200	$ 200
Waste Disposal (estimated weight)	150	200	lbs	$ 8	$ 1,125	$ 1,500
Transportation	1	1	unit	$ 150	$ 150	$ 150
Payment and Performance Bonds (5% of Project Cost)					$ 1,121	$ 1,825
Total Estimate for Haz Waste Management and Disposal					***$ 23,536***	***$ 38,330***

Qualified Environmental Professional Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
CAP Revisions, Regulatory Coordination	45	65	hr	$ 85	$ 3,825	$ 5,525
Preparation, Pre-Construction Planning, Health and Safety, Logistics	20	30	hr	$ 120	$ 2,400	$ 3,600
Topsoil Verification Sampling (2 proposed sites), Reg. Approval	2	3	sites	$ 1,500	$ 3,000	$ 4,500
price includes field work, lab analysis, equipment, reporting, and management	20	40	samples	$ 167	$ 3,340	$ 6,680
Confirmatory PCB Sampling (Concrete in basement to be buried) sample unit price includes field work, analytical, reporting, and management costs	30	60	samples	$ 167	$ 5,010	$ 10,020
TSCA Compliance	15	40	hr	$ 120	$ 1,800	$ 4,800
QEP Oversight and Daily Reporting (5 months - 6 day/wk ~ 10 hr/days)	750	1,250	hr	$ 75	$ 56,250	$ 93,750
Field Expenses - travel, mileage, consumables, equipment, misc.	75	125	day	$ 250	$ 18,750	$ 31,250
QEP Management, Regulatory Corresp., Meetings (5 months)	125	175	hr	$ 120	$ 15,000	$ 21,000
Dust Monitoring -Dust Trak 8520 (4 units - 5 months - 6 day/wk)	16	20	week	$ 2,600	$ 41,600	$ 52,000
Completion Reporting	45	70	hr	$ 120	$ 5,400	$ 8,400
Total Estimate for QEP Services					***$ 156,375***	***$ 241,525***

Resident Engineering Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Preparation, Pre-Construction Planning	20	30	hr	$ 75	$ 1,500	$ 2,250
RE Services / Demo Oversight (5 months - 6 day/wk ~ 10 hr/days)	750	1,250	hr	$ 75	$ 56,250	$ 93,750
Field Expenses - travel, mileage, consumables, equipment, misc.	75	125	day	$ 150	$ 11,250	$ 18,750
Vibration Monitoring during Demolition	3	4	sensors	$ 1,500	$ 4,500	$ 6,000
Noise Monitoring - decibel meter	1	1	unit	$ 350	$ 350	$ 350
Pre-construction survey of surrounding buildings	1	2	unit	$ 1,100	$ 1,100	$ 2,200
Compaction Testing (assumes ~2 weeks of backfill)	1.5	2.5	week	$ 5,000	$ 7,500	$ 12,500
Total Estimate for RE Services					***$ 82,450***	***$ 135,800***

Additional Expenses

Historic Preservation / Compliance					$ 10,000	$ 15,000
Permitting - zoning permit only - no building or trades permits					$ 20,457	$ 26,748
Bid Package Preparation Services - (Assumes 7.5% of Demo, Abatement, and Remediation)					$ 233,047	$ 305,629
Contingency (assumed High Risk @ 15%)					$ 501,917	$ 667,857
Administrative-City Staff (assumed 5% of project cost, subject to change based on additional information)					$ 167,306	$ 222,619
Total Estimate for Additional Expenses					***$ 932,727***	***$ 1,237,853***
					Low Est.	***High Est.***
Scenario 2 Total Estimated Cost					***$ 4,278,843***	***$ 5,690,235***

Demolition - Moran Plant Scenario 3

Item:	Quantity:	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate (5% Contingency Added)
General Conditions					
Management, Office Trailer, Tools, Misc. Expenses	1	lump sum	$ 350,000	$ 350,000	$ 367,500
Mobilization/ Demobilization	1	lump sum	$ 80,000	$ 80,000	$ 84,000
Site Preparation					
Chain Link Fence/ Perimeter Fence W/ Screen	1,200	lf	$ 15	$ 18,000	$ 18,900
Traffic Control (at bike path)	120	day	$ 300	$ 36,000	$ 37,800
Erosion Control					
Construction Entrance	1	ea	$ 3,000	$ 3,000	$ 3,150
Wire Backed Silt Fence	2,000	lf	$ 5	$ 10,000	$ 10,500
Sediment Boom	300	lf	$ 25	$ 7,500	$ 7,875
Building Demolition					
Soft Strip Building Interior	1	lump sum	$ 40,000	$ 40,000	$ 42,000
Dust Control	1	lump sum	$120,000	$ 120,000	$ 126,000
Mass Demolition	1	sf	$630,000	$ 630,000	$ 661,500
Dispose of Brick & Concrete Masonry Units	2,800	ton	$ 125	$ 350,000	$ 367,500
Dispose of Cast-in-Place Concrete	7,400	ton	$ 125	$ 925,000	$ 971,250
Dispose of Construction and Demolition Material	250	ton	$ 125	$ 31,250	$ 32,813
Dispose of Structural Steel	600	ton	$ 125	$ 75,000	$ 78,750
Earthwork					
Excavate and Backfill Soil Adjacent to Existing Foundation to Support Removal of Concrete to Elevation 96	660	cy	$ 20	$ 13,200	$ 13,860
Disposal of an Assumed 25% of Excavated Soil	215	ton	$ 125	$ 26,813	$ 28,153
Install Flowable Fill Below Slab	800	cy	$ 120	$ 96,000	$ 100,800
Perforate Slab and Mud Mat	1	lump sum	$ 20,000	$ 20,000	$ 21,000
Install Structural Backfill	5,665	cy	$ 30	$ 169,950	$ 178,448
Restoration					
Remove 6 Inches of Soil Within 50 Feet of Building	780	ton	$ 125	$ 97,500	$ -
Remove 18 Inches of Soil Within 50 Feet of Building	2,340	ton	$ 125	$ -	$ 292,500
Analytically Verified "Clean" Topsoil, 6-inch isolation barrier	800	cy	$ 75	$ 60,000	
Analytically Verified "Clean" Topsoil, 18-inch isolation per proposed IRule	2,400	cy	$ 75	$ -	$ 180,000
Seed and Mulch	1	lump sum	$ 5,000	$ 5,000	$ 5,250
Payment and Performance Bonds (5% of Project Cost)				$ 158,211	$ 181,477
	Total Estimate Demolition Cost			***$ 3,322,423***	***$ 3,811,026***

Demolition Assumptions

- High Cost Estimate includes a 5% contingency on all costs.
- All asbestos is removed from the building prior to demolition
- Assumes roof is removed by others
- All permits and fees are by others
- Pumping and treating of groundwater by others
- Soil compaction testing by others
- Pumps and other equipment are cleaned or removed and disposed of by other prior to demolition
- Dust monitoring by others
- Assumes all painted masonry is Non TSCA PCB <50 ppm

Asbestos/ LBP / PCB Building Materials

ITEM:	Low Cost Estimate	High Cost Estimate
Professional Environmental Inspection Services		
Comprehensive Asbestos Inspection	$ 4,500	$ 21,000
PCB Building Materials Inspection	$ 7,200	$ 7,200
Comprehensive Lead-Based Paint Inspection	$ 2,500	$ 2,500
Lead TCLP Update	$ 850	$ 850
Asbestos Containing Materials		
Asbestos Abatement/Basement, Main Room, Hardboard	$ 16,600	$ 16,600
Asbestos Abatement/Basement, Miscellaneous TSI	$ 3,100	$ 3,100
Asbestos Abatement/Basement, South Room, Equipment	No Work	$ 2,800
Asbestos Abatement/Basement, Main Room, SE, Equipment	No Work	$ 5,250
Asbestos Abatement/Main Floor, South Room, Large Equipment	No Work	$ 17,600
Asbestos Abatement/Main Floor, Bathroom, Shower Area	$ 9,350	$ 9,350
Asbestos Abatement/Upper Level, North Wall, Hardboard	$ 33,180	$ 55,000
Asbestos Abatement/Interior, Misc. Electrical Wiring Insulation	No Work	$ 7,000
Asbestos Abatement/Exterior, Window Caulking & Glazing	$ 13,500	$ 72,200
Asbestos Abatement/Exterior, North Steel Structures	$ 28,000	$ 72,000
Asbestos Abatement/Exterior, Roof	$ 42,300	$ 157,500
Asbestos Abatement/Contingency (10%)	$ 16,108	$ 44,995
Asbestos Abatement/Project Bonds (5%)	$ 8,859	$ 24,747
Lead-Based Paint		
Lead-Based Paint Abatement	No Work	No Work
PCB's in Building Materials		
Paint/Coatings Removal, Basement, Remaining Bldg. Materials	No Work	No Work
Building Material Removal & Disposal	No Work	$ 20,000
Building Material Removal & Disposal/Contingency (10%)	n/a	$ 2,000
Building Material Removal & Disposal/Project Bonds (5%)	n/a	$ 1,000
Professional Services Related to Abatement/Demolition		
Project Planning/Design/Contractor Bid Process Admin.	$ 7,500	$ 7,500
Project Monitoring/Project Mgmt./Clearance Procedures	$ 12,700	$ 29,700
NESHAPs Compliance During Building Demolition	$ 24,500	$ 24,500
Total Estimate ACM, Lead Paint, and PCB Building Materials Cost	***$ 230,747***	***$ 604,392***

Demolition - Moran Plant Scenario 3- continued

Transportation and Disposal of Additional Remediation Waste

Item:	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Hazardous Waste Transport & Disposal (soil, brick & concrete)						
Waste Disposal	0	0	yrd	$ 275	$ -	$ -
Transportation-25 yard dump trailers (28 ton/load min)	0	4	load	$ 2,750	$ -	$ 11,000
Electrical Equipment Removal & Disposal						
Supervisor	2	2	day	$ 700	$ 1,400	$ 1,400
Technician x 2 men	2	2	day	$ 1,200	$ 2,400	$ 2,400
Electrical Equipment precharacterization and PCB analysis sampling & te	5	10	samples	$ 175	$ 875	$ 1,750
Utility Truck	2	2	day	$ 300	$ 600	$ 600
85 Ton Crane	1	1	day	$ 4,975	$ 4,975	$ 4,975
Flat Bed Trailer	1	1	day	$ 1,350	$ 1,350	$ 1,350
Electrical Equipment Recycling (Assumed Non-PCB Containing	1	1	lump sum	$ 3,500	$ 3,500	$ 3,500
Electrical Equipment in the basement (pumps) Non-Asbestos, Non PCB equipment	1		lump sum	$ 2,000	$ 2,000	$ -
Electrical Equipment (PCB's> 50 PPM<500 PPM) if needed		1	lump sum	$ 12,000	$ -	$ 12,000
Television (CRT's)	5	5	unit	$ 100	$ 500	$ 500
Fluorescent Light Bulbs	3	5	box	$ 45	$ 135	$ 225
Mercury Vapor Light Bulbs Removal, Transportation & Disposal (Universal Waste)						
Labor & Equipment for Removal						
Supervisor	16	16	hr	$ 70	$ 1,120	$ 1,120
Technician	16	16	hr	$ 60	$ 960	$ 960
Utility Truck	2	2	day	$ 150	$ 300	$ 300
Hydraulic Man Lift Mob./Demob.	2	2	each	$ 200	$ 400	$ 400
Hydraulic Lift	1	1	day	$ 425	$ 425	$ 425
Level C PPE	2	2	day	$ 100	$ 200	$ 200
Waste Disposal (estimated weight)	150	200	lbs	$ 8	$ 1,125	$ 1,500
Transportation	1	1	unit	$ 150	$ 150	$ 150
Payment and Performance Bonds (5% of Project Cost)					$ 1,121	$ 2,238
Total Estimate for Haz Waste Management and Disposal					***$ 23,536***	***$ 46,993***

Qualified Environmental Professional Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
CAP Revisions, Regulatory Coordination	45	65	hr	$ 85	$ 3,825	$ 5,525
Preparation, Pre-Construction Planning, Health and Safety, Logistics	20	30	hr	$ 120	$ 2,400	$ 3,600
Topsoil Verification Sampling (2 proposed sites), Reg. Approval	2	3	sites	$ 1,500	$ 3,000	$ 4,500
Confirmatory PCB Sampling (Soil surrounding project area), sample unit price includes field work, lab analysis, equipment, reporting, and management	20	40	samples	$ 167	$ 3,340	$ 6,680
Confirmatory PCB Sampling (Concrete in basement walls to be buried) sample unit price includes field work, analytical, reporting, and management costs	0	0	samples	$ 167	$ -	$ -
TSCA Compliance	10	20	hr	$ 120	$ 1,200	$ 2,400
QEP Oversight and Daily Reporting (6 months - 6 day/wk ~ 10 hr/days)	900	1,500	hr	$ 75	$ 67,500	$ 112,500
Field Expenses - travel, mileage, consumables, equipment, misc.	90	150	day	$ 250	$ 22,500	$ 37,500
QEP Management, Regulatory Corresp., Meetings (6 months)	150	210	hr	$ 120	$ 18,000	$ 25,200
Dust Monitoring -Dust Trak 8520 (4 units - 6 months - 6 day/wk)	20	24	week	$ 2,600	$ 52,000	$ 62,400
Completion Reporting	45	70	hr	$ 120	$ 5,400	$ 8,400
Total Estimate for QEP Services					***$ 179,165***	***$ 268,705***

Resident Engineering Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Preparation, Pre-Construction Planning	20	30	hr	$ 75	$ 1,500	$ 2,250
RE Services / Demo Oversight (6 months - 6 day/wk ~ 10 hr/days)	900	1,500	hr	$ 75	$ 67,500	$ 112,500
Field Expenses - travel, mileage, consumables, equipment, misc.	90	150	day	$ 150	$ 13,500	$ 22,500
Vibration Monitoring during Demolition	3	4	sensors	$ 1,500	$ 4,500	$ 6,000
Noise Monitoring - decibel meter	1	1	unit	$ 350	$ 350	$ 350
Pre-construction survey of surrounding buildings	1	2	unit	$ 1,100	$ 1,100	$ 2,200
Compaction Testing (assumes ~2 weeks of backfill)	1.5	2.5	week	$ 5,000	$ 7,500	$ 12,500
Total Estimate for RE Services					***$ 95,950***	***$ 158,300***

Additional Expenses

Historic Preservation / Compliance					$ 10,000	$ 15,000
Permitting - zoning permit only - no building or trades permits					$ 23,509	$ 29,266
Bid Package Preparation Services - (Assumes 7.5% of Demo, Abatement, and Remediation)					$ 268,253	$ 334,681
Contingency (assumed High Risk @ 15%)					$ 577,773	$ 733,412
Administrative-City Staff (assumed 5% of project cost, subject to change based on additional information)					$ 192,591	$ 244,471
Total Estimate for Additional Expenses					***$ 1,072,126***	***$ 1,356,830***
					Low Est.	***High Est.***
Scenario 3 Total Estimated Cost					***$ 4,923,947***	***$ 6,246,245***

Demolition - Moran Plant Scenario 4

Item:	Quantity:	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate (5% Contingency Added)
General Conditions					
Management, Office Trailer, Tools, Misc. Expenses	1	lump sum	$420,000	$ 420,000	$ 441,000
Mobilization/ Demobilization	1	lump sum	$ 80,000	$ 80,000	$ 84,000
Site Preparation					
Chain Link Fence/ Perimeter Fence W/ Screen	2,000	lf	$ 15	$ 30,000	$ 31,500
Traffic Control (at bike path)	180	day	$ 300	$ 54,000	$ 56,700
Erosion Control					
Construction Entrance	1	ea	$ 3,000	$ 3,000	$ 3,150
Wire Backed Silt Fence	2,000	lf	$ 5	$ 10,000	$ 10,500
Sediment Boom	300	lf	$ 25	$ 7,500	$ 7,875
Building Demolition					
Soft Strip Building Interior	1	lump sum	$ 40,000	$ 40,000	$ 42,000
Dust Control	1	lump sum	$150,000	$ 150,000	$ 157,500
Mass Demolition	1	sf	$850,000	$ 850,000	$ 892,500
Dispose of Brick & Concrete Masonry Units	2,800	ton	$ 125	$ 350,000	$ 367,500
Dispose of Cast-in-Place Concrete	14,800	ton	$ 125	$ 1,850,000	$ 1,942,500
Dispose of Construction and Demolition Material	250	ton	$ 125	$ 31,250	$ 32,813
Dispose of Structural Steel	600	ton	$ 125	$ 75,000	$ 78,750
Earthwork					
Install and Remove Temporary Sheet Piling/ Barrier Wall	27,200	sf	$ 30	$ 816,000	$ 856,800
Excavate and Backfill Soil Adjacent to Existing Foundation to Support Removal of Concrete	4,300	cy	$ 20	$ 86,000	$ 90,300
Excavate and Backfill Soil Between Elevation 96 and 83.5	2,800.00	cy	$ 20	$ 56,000	$ 58,800
Disposal of an Assumed 25% of Excavated Soil	2,314	ton	$ 125	$ 289,250	$ 303,713
Install Structural Backfill (includes replacement of 25% contaminated soil)	11,780	cy	$ 30	$ 353,400	$ 371,070
Restoration					
Remove 6 Inches of Soil Within 50 Feet of Building	780	ton	$ 125	$ 97,500	$ -
Remove 18 Inches of Soil Within 50 Feet of Building	2,340	ton	$ 125	$ -	$ 292,500
Analytically Verified "Clean" Topsoil, 6-inch isolation barrier	800	cy	$ 75	$ 60,000	
Analytically Verified "Clean" Topsoil, 18-inch isolation per proposed IRule	2,400	cy	$ 75	$ -	$ 180,000
Seed and Mulch	1	lump sum	$ 5,000	$ 5,000	$ 5,250
Payment and Performance Bonds (5% of Project Cost)				$ 285,695	$ 315,336
	Total Estimate Demolition Cost			***$ 5,999,595***	***$ 6,622,056***

Demolition Assumptions

- High Cost Estimate includes a 5% contingency on all costs.
- All asbestos is removed from the building prior to demolition
- Assumes roof is removed by others
- All permits and fees are by others
- Pumping and treating of groundwater by others
- Soil compaction testing by others
- Pumps and other equipment are cleaned or removed and disposed of by other prior to demolition
- Dust monitoring by others
- Assumes all painted masonry is Non TSCA PCB <50 ppm

Asbestos/ LBP / PCB Building Materials

ITEM:	Low Cost Estimate	High Cost Estimate
Professional Environmental Inspection Services		
Comprehensive Asbestos Inspection	$ 4,500	$ 21,000
PCB Building Materials Inspection	$ 7,200	$ 7,200
Comprehensive Lead-Based Paint Inspection	$ 2,500	$ 2,500
Lead TCLP Update	$ 850	$ 850
Asbestos Containing Materials		
Asbestos Abatement/Basement, Main Room, Hardboard	$ 16,600	$ 16,600
Asbestos Abatement/Basement, Miscellaneous TSI	$ 3,100	$ 3,100
Asbestos Abatement/Basement, South Room, Equipment	No Work	$ 2,800
Asbestos Abatement/Basement, Main Room, SE, Equipment	No Work	$ 5,250
Asbestos Abatement/Main Floor, South Room, Large Equipment	No Work	$ 17,600
Asbestos Abatement/Main Floor, Bathroom, Shower Area	$ 9,350	$ 9,350
Asbestos Abatement/Upper Level, North Wall, Hardboard	$ 33,180	$ 55,000
Asbestos Abatement/Interior, Misc. Electrical Wiring Insulation	No Work	$ 7,000
Asbestos Abatement/Exterior, Window Caulking & Glazing	$ 13,500	$ 72,200
Asbestos Abatement/Exterior, North Steel Structures	$ 28,000	$ 72,000
Asbestos Abatement/Exterior, Roof	$ 42,300	$ 157,500
Asbestos Abatement/Contingency (10%)	$ 16,108	$ 44,995
Asbestos Abatement/Project Bonds (5%)	$ 8,859	$ 24,747
Lead-Based Paint		
Lead-Based Paint Abatement	No Work	No Work
PCB's in Building Materials		
Paint/Coatings Removal, Basement, Remaining Bldg. Materials	No Work	No Work
Building Material Removal & Disposal	No Work	$ 20,000
Building Material Removal & Disposal/Contingency (10%)	n/a	$ 2,000
Building Material Removal & Disposal/Project Bonds (5%)	n/a	$ 1,000
Professional Services Related to Abatement/Demolition		
Project Planning/Design/Contractor Bid Process Admin.	$ 7,500	$ 7,500
Project Monitoring/Project Mgmt./Clearance Procedures	$ 12,700	$ 29,700
NESHAPs Compliance During Building Demolition	$ 24,500	$ 24,500
Total Estimate ACM, Lead Paint, and PCB Building Materials Cost	***$ 230,747***	***$ 604,392***

Demolition - Moran Plant Scenario 4 - continued

Transportation and Disposal of Additional Remediation Waste

Item:	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Hazardous Waste Transport & Disposal (soil, brick & concrete)						
Waste Disposal	0	0	yrd	$ 275	$ -	$ -
Transportation-25 yard dump trailers (28 ton/load min)	0	4	load	$ 2,750	$ -	$ 11,000
Hazardous Waste Transport & Disposal (sediment to Canada)						
Sediment Waste Disposal in Sub-Basement Channels (22 ton/min load), conservatively assumed 655 tons, based on four flumes being entirely filled with sediment and five pipe tunnels being partially filled	200	655	ton	$ 280	$ 56,000	$ 183,400
Hydro Excavation of sediment & Sludge from Sub-Basement Channels (655 Tons)						
Super Vac	10	15	day	$ 1,950	$ 19,500	$ 29,250
Supervisor	10	15	day	$ 700	$ 7,000	$ 10,500
Technician x 4 men	10	15	day	$ 2,400	$ 24,000	$ 36,000
CSE Equipment	10	15	day	$ 200	$ 2,000	$ 3,000
Level B Supplied Air PPE (2 Men/day)	10	15	day	$ 430	$ 4,300	$ 6,450
Air Monitoring	10	15	day	$ 150	$ 1,500	$ 2,250
Coppus Blowers	10	15	day	$ 150	$ 1,500	$ 2,250
PPE/man/day	10	15	day	$ 200	$ 2,000	$ 3,000
Utility Truck x 2	10	15	day	$ 300	$ 3,000	$ 4,500
Hazardous Waste Transport & Disposal (TSCA Concrete, PCB > 50 ppm)						
TSCA Hazardous Concrete Disposal (22 ton/min load), conservatively assumed 114 tons, based on assumption that 10% of basement concrete floor is found to have PCB concentrations > 50 ppm once removed	0	114	ton	$ 750	$ -	$ 85,500
Electrical Equipment Removal & Disposal						
Supervisor	2	2	day	$ 700	$ 1,400	$ 1,400
Technician x 2 men	2	2	day	$ 1,200	$ 2,400	$ 2,400
Electrical Equipment precharacterization and PCB analysis sampling & tes	5	10	samples	$ 175	$ 875	$ 1,750
Utility Truck	2	2	day	$ 300	$ 600	$ 600
85 Ton Crane	1	1	day	$ 4,975	$ 4,975	$ 4,975
Flat Bed Trailer	1	1	day	$ 1,350	$ 1,350	$ 1,350
Electrical Equipment Recycling (Assumed Non-PCB Containing Equipment)	1	1	lump sum	$ 3,500	$ 3,500	$ 3,500
Electrical Equipment in the basement (pumps) Non-Asbestos, Non PCB equipment	1		lump sum	$ 2,000	$ 2,000	$ -
Electrical Equipment (PCB's> 50 PPM<500 PPM) if needed		1	lump sum	$ 12,000	$ -	$ 12,000
Television (CRT's)	5	5	unit	$ 100	$ 500	$ 500
Fluorescent Light Bulbs	3	5	box	$ 45	$ 135	$ 225
Mercury Vapor Light Bulbs Removal, Transportation & Disposal (Universal Waste)						
Labor & Equipment for Removal						
Supervisor	16	16	hr	$ 70	$ 1,120	$ 1,120
Technician	16	16	hr	$ 60	$ 960	$ 960
Utility Truck	2	2	day	$ 150	$ 300	$ 300
Hydraulic Man Lift Mob./Demob.	2	2	each	$ 200	$ 400	$ 400
Hydraulic Lift	1	1	day	$ 425	$ 425	$ 425
Level C PPE	2	2	day	$ 100	$ 200	$ 200
Waste Disposal (estimated weight)	150	200	lbs	$ 8	$ 1,125	$ 1,500
Transportation	1	1	unit	$ 150	$ 150	$ 150
Groundwater Treatment Trailer (GAC) System (approx. 350 Gallons/minute)-Dewatering						
Mob./Demob. set up and tear down of trailer unit	2	2	each	$ 4,000	$ 8,000	$ 8,000
GAC System Trailer Rental	1	2	month	$ 34,500	$ 34,500	$ 69,000
21K Frac Tank Mob./Demob.	2	2	each	$ 1,250	$ 2,500	$ 2,500
21K Frac Tank Rental	30	60	day	$ 36	$ 1,080	$ 2,160
Frac Tank Cleaning	1	1	each	$ 2,450	$ 2,450	$ 2,450
Liquid phase carbon	3,000	4,000	lbs	$ 2	$ 4,800	$ 6,400
Disposable bag filters	8	8	each	$ 175	$ 1,400	$ 1,400
Labor for changeout (if needed)	16	16	hr	$ 165	$ 2,640	$ 2,640
Vac Truck-Carbon media changeout	2	2	day	$ 650	$ 1,300	$ 1,300
55 Gallon Drums	5	10	drum	$ 55	$ 275	$ 550
Disposal: Non-RCRA, Non-DOT Regulated Carbon (Waste Characterization Analysis required; by others)	20	25	drum	$ 285	$ 5,700	$ 7,125
Waste Transportation	1	1	unit	$ 200	$ 200	$ 200
Payment and Performance Bonds (5% of Project Cost)					$ 10,403	$ 25,729
Total Estimate for Haz Waste Management and Disposal					***$ 218,463***	***$ 540,309***

Qualified Environmental Professional Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
CAP Revisions, Regulatory Coordination	45	65	hr	$ 85	$ 3,825	$ 5,525
Preparation, Pre-Construction Planning, Health and Safety, Logistics	20	30	hr	$ 120	$ 2,400	$ 3,600
Topsoil Verification Sampling (2 proposed sites), Reg. Approval	2	3	sites	$ 1,500	$ 3,000	$ 4,500
Confirmatory PCB Sampling (Soil surrounding project area), sample unit price includes field work, lab analysis, equipment, reporting, and	20	40	samples	$ 167	$ 3,340	$ 6,680
PCB Sampling (Concrete disposal characterization) sample unit price includes field work, analytical, reporting, and management costs	20	40	samples	$ 167	$ 3,340	$ 6,680
TSCA Compliance	15	40	hr	$ 120	$ 1,800	$ 4,800
QEP Oversight and Daily Reporting (4 months - 6 day/wk ~ 10 hr/days)	1,350	2,250	hr	$ 75	$ 101,250	$ 168,750
Field Expenses - travel, mileage, consumables, equipment, misc.	135	225	day	$ 250	$ 33,750	$ 56,250
QEP Management, Regulatory Corresp., Meetings (4 months)	225	315	hr	$ 120	$ 27,000	$ 37,800
Dust Monitoring -Dust Trak 8520 (4 units - 4 months - 6 day/wk)	27	36	week	$ 2,600	$ 70,200	$ 93,600
Completion Reporting	50	80	hr	$ 120	$ 6,000	$ 9,600
Total Estimate for QEP Services					***$ 255,905***	***$ 397,785***

Resident Engineering Services

	Quantity: Low	Quantity: High	Units:	Unit Cost:	Low Cost Estimate	High Cost Estimate
Preparation, Pre-Construction Planning	20	30	hr	$ 75	$ 1,500	$ 2,250
RE Services / Demo Oversight (9 months - 6 day/wk ~ 10 hr/days)	1,350	2,250	hr	$ 75	$ 101,250	$ 168,750
Field Expenses - travel, mileage, consumables, equipment, misc.	135	225	day	$ 150	$ 20,250	$ 33,750
Vibration Monitoring during Demolition	3	4	sensors	$ 1,500	$ 4,500	$ 6,000
Noise Monitoring - decibel meter	1	1	unit	$ 350	$ 350	$ 350
Pre-construction survey of surrounding buildings	1	2	unit	$ 1,100	$ 1,100	$ 2,200
Compaction Testing (assumes ~2 weeks of backfill)	2	3	week	$ 5,000	$ 7,500	$ 12,500
Total Estimate for RE Services					***$ 136,450***	***$ 225,800***

Additional Expenses

Historic Preservation / Compliance					$ 10,000	$ 15,000
Permitting - zoning permit only - no building or trades permits					$ 42,177	$ 50,744
Bid Package Preparation Services - (Assumes 7.5% of Demo, Abatement, and Remediation)					$ 483,660	$ 582,507
Contingency (assumed High Risk @ 15%)					$ 1,026,174	$ 1,258,551
Administrative-City Staff (assumed 5% of project cost, subject to change based on additional information)					$ 342,058	$ 419,517
Total Estimate for Additional Expenses					***$ 1,904,070***	***$ 2,326,319***
					Low Est.	***High Est.***
Scenario 4 Total Estimated Cost					***$ 8,745,230***	***$ 10,716,661***